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GENERAL ARRANGEMENT.

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CONSTRUCTION AND REPAIR.

GERMAN BATTLESHIP BADEN.

Source: Reliable.

15 August, 1919.

(12398)

On 31st July and 1st and 2d August, the writer had the opportunity to go on board the ex-German battleship *Baden*, then in the floating dock at His Majesty's dockyard, Invergordon, and make an inspection as far as conditions permitted from the standpoint of design and construction. This vessel had lately been scuttled by the Germans at Scapa, but, due to miscarriage of orders, certain of the flooding valves had not been opened and the vessel sank so slowly that it was possible for certain units of the British Navy to tow her into shallow water and land her on the beach before she had submerged to such a depth as to make salvage difficult. A number of the flooding valves were then closed and sufficient water pumped out to allow towing the vessel to Invergordon and docking in the big floating dock there. Apparently, the greater portion of the vessel had been flooded up to the second deck, as very nearly all decks up to and including this deck had a certain amount of water remaining, which had not been drained out when the vessel was boarded by the writer on 31st July. The generator rooms had been flooded and there were no lights on board, and access to below-deck spaces was very difficult and hazardous. Wax candles afforded the only light available and as all doors and hatches were open, the draft through these openings invariably put one's candle out when passing through. In addition, there was a certain amount of danger in taking naked light through the vessel, on account of the gases from coal and oil bunkers. It is understood that one of the oil bunkers was blown up in this manner the day after the writer left the vessel, killing two men and injuring seriously several others. The cold-storage spaces contained a small amount of meat and other provisions, which had been flooded and this was decomposed to such an extent that the spaces had to be sealed in order to prevent, as far as possible, the spreading of foul odors to other parts of the vessel. All double bottoms were completely filled with water, also all boiler and engine rooms and lower coal bunkers were full up to the level of

the floor plates. This was being drained out through a small number of 1-inch holes drilled in the shell plating and was a very slow process considering that the hundreds of tons of water on the decks above, were being drained into the bilges in addition. It will therefore be seen that the inspection was made under very great difficulties. Many features of special interest to the naval constructor were not accessible due, in some cases, to insufficient light, and in others to water or to the extremely filthy condition of the vessel. It was impossible, in passing through the vessel under such conditions, to get a very definite idea of such things as ventilation and water systems. Also many details that might have been of interest escaped notice. The ventilation and piping systems, however, are shown fairly well on small scale general-arrangement plans found on board the vessel by the British authorities. These plans are now in use by the dockyard authorities in connection with drying and cleaning out the vessel. They were not available for a sufficient time to make general comment on these systems, or to form a definite idea of the principles involved, but the chief constructor gave assurance that he would make it possible for copies to be obtained when the originals were no longer required by the dockyard. These plans will be forwarded later. They will show many interesting features not discussed in detail herein, such as access, the use of double doors, arrangement of bridges, machinery, uptakes, coal bunkers, etc. These plans, however, will not show certain alterations which apparently have been made in the vessel since she was completed, principally the changing of the three forward boiler rooms to use oil fuel, the omission of tubes in forward torpedo room and rearrangement of this space into smaller compartments, and the omission of searchlights from turret tops.

In referring to decks in this report, the U. S. Navy nomenclature has been used.

General Dimensions, etc.

	Ft.	In.
Length of water line	588	3
Length over all	590	1
Breadth	98	5
Draft, loaded	27	8
Freeboard, forward at above draft	23	8
Freeboard, amidships at above draft	13	6
Freeboard, aft at above draft	15	1
Main battery, eight 15-inch 45-caliber guns in four turrets. Secondary battery, sixteen 5.9-inch guns in casemates and eight 3-inch high angle guns in open on upper deck. (Only two of the 3-inch guns were on board.)		
Height of guns above water line, No. 1 turret	28	6
Height of guns above water line, No. 2 turret	38	11
Height of guns above water line, No. 3 turret	31	5

	Ft.	In.
Height of guns above water line, No. 4 turret	21	1
Turrets are numbered from forward.		
Height of 5.9-inch guns above water line	[1]17	6
Floor of uppermost control station above water line	114	8
Top of smokestack above water line	85	0
Flat keel begins to rise 60 feet aft of F. P.		
Flat keel begins to rise 50 feet forward of A. P.		
Frame spacing, about	3	11¾
Frames are numbered from aft.		
Center line of rudder forward of after perpendicular, about	27	0
Center of center line propeller forward A. P	35	10
Center of wing propellers forward of A. P	43	10
Center of wing propellers outboard of center line	16	5
Tips of propeller blades above bottom of keel		24
Diameter of propellers, roughly	12	9
Overall length of vertical member tripod mast (tripod steps on upper deck)	91	0
Protective deck, forward and steering gear compartment to bulkhead 118	[2]27	8
Protective deck forward of frame 118	[2]23	0
Protective deck in way of steering gear compartment	[2]29	0

Armor and Other Protection.

Thickness of top		13¾
Thickness at bottom		6$\frac{11}{16}$
Length of taper	4	0
Total depth of plate	12	3
Extends below water line about	5	6

This belt appears to be of the above uniform thickness over the length between the after transverse armor bulkhead at frame 30 and the forward transverse armor bulkhead at frame 118, these bulkheads being at the after and forward sides of No. 4 and No. 1 barbettes, respectively.

Immediately aft of frame 30 the armor tapers over a length of 20 feet to 9⅞ inches thickness, which appears to be the uniform thickness to within about 50 feet of the stern, from which point it tapers to 7⅛ inches at the transverse armor bulkhead at stern on frame 5. Forward of the transverse armor bulkhead, at frame 118, the lower belt is extended in depth to mid height of the upper belt and is 9⅞ inches in thickness, having been tapered to this thickness through one plate about 10 feet long. This thickness appears to be uniform to a point within 50 feet of the bow, from which point it tapers to 5⅞ inches at the transverse armor bulkhead on frame 137.

Upper Side Belt.

	Feet.	In.
Thickness throughout		9⅞
Depth, roughly	7	3

[1]Average. [2] Above keel.

Extends from transverse armor bulkhead on frame 30 at the after end of No. 4 barbette to transverse armor bulkhead on frame No. 118 at the forward end of No. 1 barbette.

Casement Armor.

Thickness throughout ..... $6\frac{11}{16}$"

Extends from its diagonal connection at frame 46 to No. 3 barbette armor to its diagonal connection at frame 114 to No. 1 barbette armor.

Circular armor shields on 5.9-inch guns $3\frac{1}{4}$ inches thick.

Transverse Armor in Way of Lower Side Belt.

	Inches.
Thickness on frame 30 outboard of torpedo bulkhead	$5\frac{1}{2}$
Thickness on frame 30 inboard of torpedo bulkhead	$9\frac{7}{8}$
Thickness on frame 118 outboard of torpedo bulkhead	$5\frac{1}{2}$
Thickness on frame 118 inboard of torpedo bulkhead	$9\frac{7}{8}$
Thickness on frame 5	$5\frac{1}{2}$
Thickness on frame 137	$5\frac{1}{2}$

Upper Transverse Armor in Way of Upper Side Belt.

Thickness on frame 30 outboard of torpedo bulkhead	$7\frac{1}{8}$
Thickness on frame 30 inboard of torpedo bulkhead	$7\frac{1}{8}$
Thickness on frame 118 outboard of torpedo bulkhead	$7\frac{1}{8}$
Thickness on frame 137	$7\frac{1}{8}$

Bulkhead on frame 137 extends from the top side of the forward protective deck to middistance between main and second decks. Bulkhead on frame 5 extends up to the under side of the second.

For thickness of armor bulkheads in way of barbettes see Barbette Armor.

No. 4 Barbette.

Upper ring extends from 2 feet 6 inches above main deck to about 18 inches below the main deck and is $13\frac{3}{4}$ inches thick, except for about 12 feet of the circumference on the center line at the forward side of barbette, which is $7\frac{7}{8}$ inches in thickness.

The lower ring extends from about 18 inches below the main deck to the second deck and is $7\frac{7}{8}$ inches thick, except for about 90° of its circumference at the after side which merges with the transverse armor bulkhead, and is $13\frac{3}{4}$ inches in thickness. The after face of the barbette between second and third decks formed by the transverse bulkhead is $13\frac{3}{4}$ inches thick.

Barbette ring between second and third decks, except for that portion formed by the continuation of the transverse armor bulkhead is not face hardened and is $4\frac{1}{2}$ inches thick.

No. 3 Barbette.

Aft of the connection of the diagonal casemate armor to the barbette, the upper ring is $13\frac{3}{4}$ inches in thickness and extends to about 18 inches below the main deck. Inside the casemate armor and

below the upper deck the armor is $6\frac{11}{16}$ inches in thickness. Above the upper deck and extending to about 18 inches below the under side of the deck it is $13\frac{3}{4}$ inches in thickness. From a point about 18 inches below the main deck down to the second deck the armor is $6\frac{1}{2}$ inches in thickness with the exception of about 45° of the circumference at the forward side of the barbette, which is $3\frac{1}{8}$ inches thick.

Barbette ring between second and third decks is not face hardened, and is $4\frac{1}{2}$ inches thick, except on forward side, where it is $3\frac{1}{8}$ inches thick.

No. 2 Barbette.

The upper ring extends from about 13 feet above the upper deck to a point about 18 inches below the upper deck, and is $13\frac{3}{4}$ inches in thickness, except for about 30° of its circumference on the center line at the forward side which is $9\frac{7}{8}$ inches in thickness. The middle ring extended from about 18 inches below the upper deck to the main deck, and is $6\frac{1}{2}$ inches thick. The lower ring extends from a point about 18 inches below the main deck to the second deck and is $3\frac{1}{8}$ inches in thickness throughout.

Barbette ring between second and third decks is 1 inch thick.

No. 1 Barbette.

The upper ring extends from 2 feet 6 inches above the upper deck to a point about 1 foot 6 inches below the upper deck, and it is $13\frac{3}{4}$ inches in thickness throughout. The middle ring extends from about 18 inches below the upper deck to a point about 2 feet below the main deck, and is $8\frac{1}{2}$ inches in thickness within the casemate and $13\frac{3}{4}$ inches over the whole of the forward side not inclosed by the casemate armor. The lower ring extends from a point about 2 feet below the main deck to the second deck, and is $13\frac{3}{4}$ inches in thickness forward of the transverse armor bulkhead connection, the remainder being $7\frac{1}{2}$ inches with the exception of 90° of the circumference at the after side of the barbette, which is $3\frac{1}{3}$ inches in thickness. The forward side of this barbette is protected between the second and the protective decks on the forward side by $13\frac{3}{4}$ inches armor connecting with the transverse armor bulkhead.

Barbette ring between second and third decks, except for that portion formed by the transverse armor bulkhead, is 1 inch thick.

Turret Armor.

	Inches.
Thickness, vertical front plate	$13\frac{3}{4}$
Thickness, inclined front plate	$7\frac{7}{8}$
Inclined roof plates on side	$4\frac{3}{4}$
Flat roof	$3\frac{15}{16}$

	Inches.
Side plates	$9\frac{7}{8}$
Back plates	$11\frac{7}{16}$
Shelf plates under overhang of turret	$2\frac{1}{4}$
Horizontal plates at sides of turret over barbette	7

Conning Tower.

The upper ring of the conning tower extends to a point about 2 feet 6 inches below the level of the bridge and is $13\frac{3}{4}$ inches in thickness. The middle ring extends down to a point about 2 feet 6 inches above the bridge deck, and is $9\frac{7}{8}$ inches in thickness. The lower ring extends to the upper deck and is $9\frac{7}{8}$ inches in thickness.

	Inches.
Thickness conning tower roof plate	8
Thickness fire-control tower roof plate	$3\frac{15}{16}$
Thickness bulkhead around fire-control compartment	$2\frac{1}{4}$
Thickness conning-tower tube from conning-tower floor to upper deck (inside of conning-tower armor)	$2\frac{3}{4}$
Thickness conning-tower tube upper deck to third deck	$7\frac{1}{8}$
Inside dimensions conning-tower tube, 3 feet square.	

The two upper rings of the conning-tower armor slope out at the top at an angle of 7 degrees all around, the plates in the lower ring being vertical. The fire-control tower is located in the after side of the conning tower, its top being raised above the main conning-tower roof to allow direct view forward, very similar to the original design of the *Oklahoma* conning tower, which was later altered to the present flush-roof type.

After Tower.

Sides $7\frac{1}{8}$ inches thick, extending to about 2 feet below deck on which it is located. Roof $5\frac{1}{4}$ inches thick. Tube from bottom of tower to upper deck is $7\frac{1}{8}$ inches thick. Tube from upper deck to second deck $3\frac{1}{8}$ inches.

Protective Bulkheads and Decks.

There is a longitudinal torpedo bulkhead each side about 13 feet from the shell and is 2 inches in thickness from inner bottom to a point about 3 feet above the third deck, from which point it extends to the main deck with a thickness of $1\frac{3}{16}$ inches. The above thicknesses are maintained to a short distance aft of armor bulkhead 30 and forward of bulkhead 118. The third or protective deck between the transverse limits of the after side of barbette No. 4 and the forward side of barbette No. 1 is $1\frac{3}{16}$ inches thick. This deck is horizontal inboard of the 2-inch torpedo bulkhead mentioned above, and is inclined down at an angle of 20 degrees outboard of this bulkhead. Forward and aft of the above limits, the deck is $2\frac{3}{8}$ inches thick except for that portion over the steering gear which is about 4 inches thick. The upper deck plating is $1\frac{3}{16}$ inches thick over that

portion which is bounded by the casemate armor, that is the entire deck between turrets Nos. 1 and 3. The main deck is $\frac{15}{16}$ inch thick outboard of the longitudinal torpedo bulkhead. There is no uptake protection as such.

General.

The rabbeting and fitting of armor, especially in the turrets, is a work of art. It is hard to believe that the rabbeting and machining of edges could have been done after the plates were hardened, but certainly they have not changed shape in the slightest since the machining was done.

The fitting of side armor was also perfect and the fact that the Germans could fit this so well on $1\frac{3}{8}$-inch teak backing goes to prove that their process of hardening does not warp or otherwise change the shape of the plate. It was not possible to determine whether or not the side, barbette, and tower armor was keyed. The fact that no special framing was worked back of butts in side armor indicates, however, that they were used.

The armor on the turrets was put together with practically no framing support other than a single transverse girder 15 inches deep under the roof, near the after end of the turret, and one longitudinal girder 12 inches deep, between this girder and the hoist each side, and such support as is afforded the roof by the vertical sides of the approximately 6-foot square hoist trunk. Neither wood backing nor backing plates were used. Single riveted buttstraps 2 inches thick are worked on the inside of turret armor, spacing of rivets in row $9\frac{1}{2}$ inches center to center. Where the butt was at a corner, an angle 9 inches by 9 inches by 2 inches thick formed the buttstrap. Butts of conning tower armor connected by straps 15 inches wide and $2\frac{1}{4}$ inches thick. Corner joints connected by angles 7 inches by 7 inches by 2 inches. Butts of after control tower armor connected by straps 15 inches wide and 2 inches thick. All barbette plates were connected at the inner side with straps 18 inches wide and 2 inches thick.

Barbette armor was continuous through decks in all cases, except for the second deck, on which face-hardened armor ended. This deck projected far enough to the inside of the barbette to take a 6-inch angle at the inside face of the armor ring. The heavy protective ring between the second and third decks was secured by heavy double angles, top and bottom. Conning tower armor was also continuous through decks. The different rings of barbettes and conning tower armor were rabetted and set on to the ring below with the inner vertical surface flush and the thicker ring chambered off at an angle of about 45 degrees to the thickness of the thinner ring. Straps were worked at the inner face of the ring connection.

One and three-sixteenths inch protective deck plating was fitted with treble riveted butt and seam straps on underside. The butts were not staggered, but were in line across the ship. The 2-inch plating in the torpedo bulkhead was arranged in vertical strakes and strapped. The $1\frac{3}{16}$ inch upper plating in this bulkhead was butted with double straps, $\frac{5}{8}$ inch thick, treble riveted. The very pronounced caulking at butts and seams in protective deck and bulkhead plating, and the perfection with which the 2-inch plates were scarphed, indicates that nothing better than ordinary H. T. steel has been used. The whole of the flat protective deck over the machinery was deeply roughed to provide safe footing. Neither this nor the pronounced caulking ridge at seams and butts could have been done in the S. T. S. used by us. Also hatch openings in the $1\frac{3}{16}$ inch protective deck plating were rabbeted, the square openings presumably with pneumatic tools and the circular ones by machinery. Casemate armor is backed by $1\frac{7}{8}$-inch teak planking. Armor bolts in side armor are spaced $23\frac{5}{8}$ inches fore and aft and 29 inches vertical.

Water-Tight Subdivision.

The *Baden* below the protective deck is divided by 14 main transverse bulkheads into 15 main transverse water-tight subdivisions. There are two subdivisions forward, each about 15 frame spaces long, and extend to the bulkhead at the forward end of the forward magazine space, and the two subdivisions at the stern are about the same length, extending to the bulkhead at the after end of the after magazine space. Within the limits of the two bulkheads last mentioned above, the greatest length of subdivision is 9 frames in way of the after engine rooms, the average length of subdivision in this area being about 7 to 8 frames. The transverse bulkheads forming these main water-tight subdivisions appear to have been cut below the protective deck by doors or other openings only in very exceptional cases, the transverse and longitudinal bulkheads, however, within the limits of these subdivisions, have been cut for doors and scuttles without reserve, for instance, in way of the boiler rooms, between transverse bulkheads numbers 64 and $72\frac{1}{2}$, there is a door in every longitudinal bulkhead. The 2-inch torpedo bulkhead has in it a vertical sliding door with a clear opening of about 18 by 24 inches and the two longitudinal bulkheads between boiler rooms, have in them vertical sliding doors of the ordinary type, of such size that one can walk through without stooping and with head room to spare. The longitudinal bulkheads between engine rooms all have hinged doors. These doors both in boiler room and engine room, are located just above the floor plates, which in the case of the boiler rooms, are only about 2 feet above the inner bottom. The

2-inch torpedo protection bulkhead is pierced by these doors in way of boiler rooms only. An ordinary water-tight hinged door cover is used in addition to the vertical sliding door in the longitudinal bulkhead in way of boiler rooms, and double water-tight hinged doors are used in the main transverse bulkhead between engine rooms. Transverse bulkheads inside of the air space, that is, the outermost compartment below the protective deck, are spaced an average distance of 6 frames, and are pierced near the top by a water-tight manhole. The 14 main transverse bulkheads limiting the water-tight subdivisions appear to have been extended in most cases between the protective and second decks, but the use of doors in these bulkheads appears to be more general.

Ground Tackle.

There are three anchors of 8,000 kilograms (17,640 pounds) weight each, and similar in design to our Navy standard. Chain cable, 3-inch. Attention is invited to type of conecting shackle used. The design is the same as that used on submarines. The anchor shackle is of the same design, except that it is very much heavier and over-all dimensions about 50 per cent greater than those of the connecting shackle. The length of the connecting shackle is the same as that of an ordinary link, the width, however, being slightly greater. The anchor swivel is similar to our Navy swivel.

The steam-windlass engine is located above the protective deck and drives two wildcats, one either side of center line and one grooved hawser drum located on center line at the upper deck. Arrangement for using spare anchor similar to that in use on *Oklahoma.*

Length and Size of Plates.

Shell plates are generally 6 frame spaces long, averaging 5 to 6 feet in width; 2-inch plates in torpedo bulkhead are, roughly, 10 feet 6 inches wide and 26 feet long. Protective deck plates are generally 5 to 6 feet wide and 6 frame spaces long. Flat keel plates are approximately 6 feet 6 inches wide and 6 to 7 frame spaces long.

Paravanes.

There is located under the forefoot, just aft of the bow torpedo tube, a two-eyed pad with eyes about 3 inches in diameter. About 30 feet aft of this pad, on each side of the ship and about 4 feet above the level of center line pad, is a single-eyed pad. About 30 feet farther aft still there is another single-eyed pad at a level of about 8 feet above the first mentioned. This indicates that the Germans were using some kind of mine-protection gear the details of which could not be determined.

Crew Space.

The major portion of the crew space is on the second deck outboard of the torpedo bulkhead. This space being behind the armor, had no natural ventilation or light. Portable coal chutes were used in this space when coaling the vessel but even with this, the space must have been uninhabitable during coaling periods. There were reports going round on board the vessel to the effect that the crew usually lived in barracks at the base when the vessel was not actually cruising. This is not credited, however, as outside of the lack of natural ventilation, light, and the inconvenience of having everything upset in coaling, they were apparently provided with about the same comforts and convenience allowed in the British and our navies. The remainder of the crews' space was in the gun casemates on the main deck, and was more roomy and cheerful, although this too was behind armor without air ports or side lights.

Hammocks were stowed in small compartments provided for the purpose and mess tables and benches were generally stowed in racks overhead.

Each member of the crew was provided with a locker 20 inches high, 24 inches long and 20½ inches deep, fitted with four compartments, two of which were 10 inches high by 16½ inches long, one 7 inches long by 12 inches high and one 7 inches long by 8 inches high. These lockers were built three and sometimes six to the section.

Gun-Port Fastenings.

The five 9-inch guns had a 3¼-inch circular shield fitted to the revolving part of the mount, the lower edges of this shield making a very neat fit with the lower shelf plate of the gun port. The top of the shield was roofed over with 1½-inch plating, which made a neat fit with lower edge of armor plate above. In the vertical corners of the port at the outer side, a rubber roller about 1½-inch diameter is fitted to bear tightly into the corner formed by the casemate armor and the circular face of the gun shield. On the lower shelf plate at the outside was a steel ring, rubber faced, fitted to be wedged up against the circular face of the gun shield. At the upper edge of the port a circular strip, rubber faced, is fitted to the lower edge of the armor, and is arranged to wedge down against the face of the shield roof plate. The tightening down of these strips had to be done from the outside of the gun port. The gun opening in the shield was oblong in shape, and of such height as to allow about 20° elevation and 9° depression of the guns. There were also vertical slots in the shield for gun sights. The gun opening and sight slots could be partially closed to the weather by fitted plates arranged at the inside surface of the shield.

Magazine Arrangement.

The magazines were insulated around the outer boundary of group with $\frac{1}{2}$-inch spruce pine, lagged with about $\frac{1}{2}$ inch of felt or substitute. The insulation was located 3 inches from deck or bulkheads to form air space. Bulkheads and decks inside of the outer boundary of the group of magazines were not insulated.

Flooding pipes were generally $3\frac{1}{2}$-inch diameter perforated with $\frac{1}{8}$-inch holes at underside.

The magazine flooding valve was usually located inside the magazine, and the operating gear was led across to the valve and was not protected by covering of any kind. The flooding pipe up to the flooding valve was not lagged. Flooding valves could be operated from handling room and from the main deck.

In many cases, compressed air pipes were led through magazines without lagging.

It was not possible to definitely determine the volume of air introduced for ventilating magazines, but judging from the size of the supply ducts, this was not more than the volume which would have been used in our service for the same size compartment. As far as could be ascertained, there was no heating or cooling system, and it is not believed that the vessel's magazine arrangement would be suitable for hot climates.

Stern Casting.

Stern casting is made in one piece and forms the center shaft stern tube and docking support. There is no stern casting, as such, in way of the rudders.

Stem Casting.

The stem casting extends from the main deck down to a short distance below the turn of the forefoot, and is in one piece. Between the main and upper decks, the stem is formed by a forged plate.

Rudders.

There are two rudders. They are inclined outward at the bottom at an angle of about 7°. The inclining of the rudders appears to be due to the limited space in the steering gear compartment, and a desire to split the distance between the wing and center propellers. Each rudder has an area of 193 square feet, which taking the total area bears a ratio to the area of the submerged middle line plane of approximately 1 to 40.

Shaft Struts and Boss Plating.

The center tail shaft is supported by the ordinary type of shaft strut. The space between the stern tube is located just forward of

the propeller hub, and is faired back into the shell by deep boss plating, there being no exposed shafting on either center line or wing shafts.

Docking Keels.

There are two docking keels, one in the way of the torpedo protection bulkhead and the other in way of the inboard longitudinal bulkhead. These have a 23-inch bearing surface and are built similar to our own, except that at the top portion the vertical sides are parallel. The maximum depth of the docking keel is 4 feet, which occurs at the after end of the inboard keel. The inboard keel extends from about the forward end of the forward turret space to the after end of the after turret space. The outboard keel extends only a short distance beyond the limits of the machinery spaces.

Bilge Keels.

Bilge keels are continuous forward and aft and are 240 feet long. At the midship section they are 3 feet 3 inches deep, widening forward and aft as the bilge rises to a maximum depth of 4 feet after end and 3 feet at forward end. They are built up of 15-pound plates, triangular in section, and are apparently filled with wood, the base of the triangle at the connection to the shell being approximately 9 inches.

Fairing Plates.

There is no armor shelf. The side armor is bolted onto the side of the ship in the same way as is done in our recent battleships, but the outer surface is faired in with the shell below by two plates, each about 4 feet wide, running the entire length of the lower armor belt. The space between these fairing plates and the shell is evidently filled with cement or some other substance to protect the metal from deterioration. The fairing plates are tap riveted to longitudinal framing, and there is no means of getting to the space for painting either from the outside or from the inside of the shell. These fairing plates are 15 pounds thick. It is surprising that so much material and weight should have been used to fair in the surface of the armor in this way. The forward end of the lower casemate armor is faired into the shell by 20-pound plates.

Transverse Framing.

Framing behind armor is of $10\frac{1}{4}$ by $3\frac{1}{2}$ by $3\frac{1}{2}$ inch channels spaced $23\frac{5}{8}$ inches center to center, bracketed to the sloping protective deck and the main deck as indicated on midship section. These channels are continuous through the second deck, the second deck beams being bracketed to them. Web frames at armor butts were not used.

Channel frames, other than behind armor, are spaced 3 feet 11¼ inches, except for the extreme ends of the vessel where intermediate frames are fitted. Attention is called to beam bracket shown on sketch No. 4, which is the type used generally throughout the ship for connecting deck beams to transverse frames. This sketch was drawn from bracket fitted at the main deck behind armor.

Inner Bottom Plating and Framing.

Depth of double bottom 4 feet 3 inches, about. Thickness of double-bottom plating 20 pounds. Transverse non-watertight frames are made of 12.5-pound plates, apparently continuous between watertight longitudinals and lightened between longitudinals by 19½ by 32 inch lightening holes. Non-watertight longitudinals in double bottom are intercostal between transverse frames and are built of 15-pound plating lightened between frames by 25-inch diameter lightening holes. Intercostal longitudinal plates are connected to transverse frame plates and to inner bottom plating by 2¾ by 2¾ inch angles. Watertight longitudinals are apparently continuous through the transverse frames. No stiffening on frame and longitudinal plates was noted in way of boiler rooms, where inspection was made. The vertical center line keel plate is nonwatertight, there being apparently only three watertight longitudinals on each side of center line, these in way of the three longitudinal bulkheads.

Bow and Stern Framing.

Bow framing is composed of 10-pound lightened plates intercostal between decks and stringers which are continuous to the bow casting but lightened for access. Stern framing is arranged as indicated on Plate No. 1 (plate not available); the deadwood and space inside of shaft boss plating is framed by vertical 15-pound plates lightened for access.

Decks and Platforms.

Decks other than the protective decks are generally of about same weight of plating used in similar spaces on our recent battleships. Deck beams vary in size according to local requirements and to length of unsupported beam. There were three sizes of channel beam used, viz: 7⅞ inches by 3½ inches by 3½ inches, 8 inches by 3 inches by 3 inches, 7⅛ inches by 2¾ inches by 2¾ inches. There were some spaces, however, especially under the deck in way of gun blast, where built-up deck beams were used, spaced 23⅝ inches and with a depth of 7 inches. All decks in way of spaces covered with linoleum were butted and strapped on the underside to give a flush surface.

Deck Covering.

Weather decks were covered with teak planking 2½ inches thick and 5 inches wide. Waterways were arranged around the margin of

the decks similar to our own practice and were 13 inches in width. There were no steel chafing plates on the upper deck in way of anchor chains. The seams of the planking run parallel to the line of the chain, and it is assumed that the Germans contemplated easily renewing the deck planking when worn to a great extent. All decks in living spaces were covered with linoleum, generally about three-sixteenths inch thick. Brass strips were used generally along all edges and seams of the linoleum for holding down. Decks in galleys, bathrooms, toilet spaces, etc., were covered with a kind of cement. No ceramic tiling was noted.

Outside Plating.

Outside plating to well above the turn of the bilge was 25 pounds amidships, and appears not to fall below 20 pounds at any point toward the extreme ends. The flat keel plate was an inner strake, and, as all double bottoms were partially filled with water, the thickness of this plate and the method of butting could not be determined. Plating behind armor was 25 pounds. All shell plating was fitted "in" and "out" strakes, the "out" strakes above the turn of the bilge being jogged. All butts were lapped. The two fairing plates at the lower edge of the armor belt were fitted flush, with butt and seam straps on the inside. Side plating behind armor is worked with butt and seam laps, with the "out" strakes jogged on the seam. The ends of all shell plates were chambered off at an angle of about 30°.

Structural Bulkheads.

Bulkhead below the protective deck other than protection bulkheads were in general built of 12.5 pound plate with butt and seam laps. Bulkheads extending unsupported by decks or other structure from inner bottom to the protective deck were stiffened by $10\frac{1}{4}$-inch by $3\frac{1}{2}$-inch by $3\frac{1}{2}$-inch channels, with 4-inch by 4-inch by $\frac{3}{8}$-inch reverse angle on face of channel spaced $23\frac{5}{8}$ inches. This reverse angle extended to within about 3 feet of either end of the stiffener, the standing flange of the reverse angle being tapered at each end over a length of 12 inches. In very few cases did the Germans use brackets at either the head or foot of stiffeners, but merely connected the ends by double 3-inch angle clips taking three rivets through the stiffener end. A horizontal girder was worked at the mid height of deep bulkheads on the stiffener side, the plates of which were intercostal between stiffeners with double-face angles continuous at the outside of stiffeners.

There were many different sizes of channel section used as bulkhead stiffeners and were in nearly in all cases intercostal between

decks. Water-tight bulkheads between second and third decks were generally built of 10-pound plating, stiffened with angle bar. Above the second deck 5 to 7½ pound plating appears to have been used in all cases, except for bulkheads which form support for heavy structure or fittings above.

Superstructure Plating.

Superstructure plating generally 10 pounds increased to 20 pounds in way of gun blast; plating behind casemate armor 25 pounds.

Nonstructural Bulkheads.

All nonstructural bulkheads were built of 2½-pound plating worked in vertical strakes with a light pilaster at each seam, extending from the top of the deck coaming plate to within about 6 inches of the deck overhead. The pilaster is made from 5-pound plate, the upper and lower end of the half around being flattened in at an angle of about 30° with the flange continuous around the ends. No corrugated plate bulkheads or partitions were noted.

Gun Foundations.

Foundations for 5.9-inch guns were formed by tubes of 15-pound plating, extending between the main and second decks and of the same diameter as the gun-mount base. These tubes were stiffened on the inner side by vertical angles, and in most cases were connected by plate and angles to the heavy longitudinal torpedo bulkhead. There is a cast-steel band 1¼ inches thick and 16 inches deep riveted to upper end of the tube at the outside, to which the heavy angle ring at underside of the main deck is attached. There is no other special framing forming foundations for these guns. The main deck plating on which the mount is located is $\frac{15}{16}$ inch thick.

Tripod Mast.

The center vertical member of the tripod is 36 inches outer diameter throughout and built of 15-inch plating. The inclined members are 32 inches outer diameter throughout and built of 20-pound plating. The mast plating was butted with single straps double riveted worked on the inside. Vertical angle stiffeners were fitted on the inside throughout the length of the masts. The tripod members do not merge into one another at the top, but are connected independently to the underside of the heavy floor plate of the uppermost control station, and in addition are bracketed together with heavy vertical web plates about 8 feet long connected to the masts by double angles. All three members of the tripod step on the upper deck.

Life Lines, Hand Rails, Etc.

Life lines of $\frac{1}{8}$-inch iron chain were used almost exclusively, the only exception being on the higher open platform in the mast and around the forward end of the bridge next above the conning tower, where pipe rails were used, presumably because they afforded a firmer support to lean upon. There were three life lines around the weather decks and four around the bridges. These were run through forged rail stanchions. The rail stanchions were spaced about 8 feet apart, and arranged, around the main and upper decks, to be lifted vertically $1\frac{1}{2}$ inches to clear the lower support then to swivel down flat against the inner surface of the vertical projection of the side plating. There appeared to be no general use of guard rails around hatch openings below deck. Hand rails on inclined ladders were in general, made of wire rope, seized and covered with canvas, an exception being those on weather decks leading to upper deck, bridges, etc., which were fitted with straight wooden handrails $1\frac{1}{2}$ inches diameter.

At the outer side of the bridge and platform rail and completely around such spaces, there was fitted a kind of splinter mattress composed of the ordinary wire rope torpedo netting of double width folded with material between which was something on the order of the filling used in the British splinter mattress. This material varied from 1 inch to 2 inches in thickness and appeared to have deteriorated considerably, as one could push a stick through it with ease. Canvas weather cloths were fitted around all bridges and platforms at the outside of the splinter mattress. No splinter protection was fitted on the sides of the chart house, or on the sides of the two uppermost control stations, at the top of the tripod mast. The two control stations mentioned, however, were built of 30-pound plate sides.

Ladders.

Apparently, inclined ladders were used only for access to and from living spaces, boiler rooms and such other spaces requiring constant access. These were all portable and the emergency ladder was formed by ladder rungs attached to bulkhead of trunk where this was convenient, otherwise the ordinary Jacob's ladder was used and hung loose at the bottom end. The inclined ladder was made of light flanged plate frames and steps, the steps riveted to the frames and fitted on each edge with a nonslip metal strip about 1 inch wide. The head of the frame was flanged in and arranged to fit flat against the vertical face of the hatch coaming, and was fitted with an oblong hole which caught over a simple upturned spike pad riveted to the coaming. A number of cases were noted, however, where the head of the ladder frame had not been flanged

but had been fitted with a small angle slip through which the oblong hole had been drilled to take the spike. Ladders to magazine spaces and other compartments through which continuous access was not required, were of the same type as our vertical ladders except in cases where bulkheads were convenient and the ordinary ladder rungs could be used instead. There were a few cases noted where the hatch in the protective plating had been hinged down on the inclined ladder and three ladder treads had been fitted permanently to the upper side of the hatch cover. This, however, was only done in cases where the hatch was inclosed in a trunk. Stairways to boiler rooms were arranged somewhat similar to those in the *Idaho*.

Doors.

The dogs on water-tight doors were not neatly fitted and the stuffing boxes, to say the least, were not water-tight, and would not stand up to our requirements. As a manufacturing proposition, however, the door is far ahead of ours and considerably lighter, as a whole. In no case were more than six dogs used. There was usually fitted just below the middle dog at the opening edge an additional dog of very light construction, and used only for holding the door closed when the heavier dogs were not engaged. For doors below the protective deck, the bulkhead stiffeners were worked close up to the door opening on each side with horizontal stiffener between at the upper and lower edges.

Air-tight doors were made the same as water-tight doors described above, except that cork gaskets were used instead of rubber. Doors to living spaces and to most all other spaces, were built of very light flanged plate and fitted to slide on a ¾-inch Z bar frame. Hinged doors to living spaces, galleys, etc., appear to have been used only in cases where spaces did not allow the fitting of the sliding door. The Z bar frame was worked on the outside of the bulkhead, and was twice the width of the door opening, allowing the door to bring up on the far side of the frame when open. The doorplate was flanged in ¾-inch at top and sides with shallow rubber buffers fitted at outside each flange to prevent noise when slamming door open or closed. The bottom edge was not flanged but extended straight down and ran loose behind the flange of the Z frame. Two plate clips were riveted to the top edge of the door and bent over so as to hook over the Z bar and slide along on its web, which was greased. The doorplate was stiffened on the inner side by ¾-inch angles running from each corner at an angle of about 30°. The lock was on the principle of the "pull-sideways-to-open" type, so familiar to the traveler on the London underground train system. This is considered an improvement on our type of joiner door, being much lighter, very inexpensive to make, and serves the purpose just as well, although not nearly so neat in appearance.

Instruction Plates, Instruction Model, and Label Plates.

The vessel was most thoroughly labeled from end to end and at numerous places in each transverse water-tight subdivision diagrams were posted on the bulkheads showing the important bulkheads, doors, hatches, etc., in that subdivision, and containing in many cases very useful instructions. Valves and valve-operating gear were most elaborately labeled; in fact, the labels and diagrams were carried to such an extent that it would be possible for anyone merely able to read and follow instructions to operate the system successfully. In addition, there was on board a beautiful 15-foot instruction model of the ship, constructed of thin sheet metal and arranged so that each deck could be lifted off in section showing all bulkheads, doors, and hatches on the deck next below. All flood and drain valves and their operating gear were built into the model in their proper places, and the principal leads of piping were indicated by small wiring. The model was supported in swivel bearings to give list and straight edges were arranged at each side to give trim in damaged condition, thereby indicating the relation of any compartment to the actual water-line outside. There is every evidence that this model was used for daily instructions to the crew on the subject of the pumping or flooding of the vessel in case of accident, flooding here or pumping out there to correct list due to damage. This is considered to be the secret of the Germans' success in getting their ships back to port after being mined or torpedoed and after the severe punishment reported to have been inflicted on many of them in the Dogger Bank and Jutland battles. Certainly their torpedo protection is not up to the requirements shown by our tests at Norfolk, and their water-tight subdivision is far short of what it is reported to have been. Also, the structure of the vessel as regards lower decks and bulkheads is considerably lighter than that of the British. Their water-tight bulkheads are rather weak, to say the least. Voice tubes and ventilation pipes, while only in very exceptional cases do they pierce the main transverse water-tight bulkheads at the end of a main subdivision, are run in numbers of cases horizontally below the protective deck through the water-tight bulkheads within the subdivision, and the British salvage officers made the statement that water was pouring through these for days during the time the vessel was being pumped out. They also stated that the stuffing boxes in bulkheads for passing electric leads leaked like sieves, and these were passed without reserve through main subdivision bulkheads as well as bulkheads within the subdivision. Things of this kind would naturally flood and sink the ship in time if left unattended, but with a proper pumping arrangement and men sufficiently instructed in its use to stand by and operate it, such leakage as could come in through these sources should give no one any worry so long as the main damage left a fairly good

margin of buoyancy. It is believed that we have something to learn from their methods in this connection.

Steering Gear.

The steering gear was of the right and left-hand screw type and was operated by steam engine located in compartment immediately forward of the screw-gear compartment. The engine and gear were duplicated on each side of the ship with a longitudinal bulkhead between. Each engine could operate independently its own gear, but the ordinary method was for both engines to operate in unison, their control valves being operated by one steering-hand wheel. They were cross connected by shafting and gears in such manner that either engine could operate both screwgears. Gear and engines were located in the counter beneath a 4-inch protective deck. There was also an additional deck of 1-inch thickness over the screw gear and immediately below the protective deck in which the upper bearing of the rudder stock was supported. Hand-steering gear similar to that in use by us was located in separate compartments just off the steering-engine compartment. There were only two steering wheels forward, one in the conning tower, and the other on the steering platform immediately forward of the tower and on the same level. These wheels were 18 inches in diameter and operated the steering-engine control valves at the engine through shafting and gears run down through the conning-tower tube to the underside of the protective deck, thence in practically a straight line to the cross-control shaft in the steering-engine room. The ease with which the 18-inch diameter steering wheel could be revolved indicates that the shafting was fitted with ball bearings throughout. It is not believed, however, that steering was generally done by this method of transmission, as there were a number of electric transmitters in the forward steering station mentioned above, in the conning tower, and on higher platforms, graduated very neatly to give a point on every half degree of the rudder helm, and it is believed that these were used for ordinary steering and followed up by the steersman at the hand wheel in the steering-engine room, which showed evidence of considerable use. It was not possible from either the steering stand inside the conning tower or from the stand on the steering platform forward of the same to see the bow of the vessel on account of interference of No. 2 turret. The line of sight with the top of the turret cut the flagstaff at a point about 6 feet above the upper deck. There was attached to the top of No. 2 turret, at its rotating center, a vertical piece of 1-inch pipe, evidently for use in sighting the middle line of the vessel, using the flagstaff as the far sight, although the window frame on the center line in front of the steering stand prevented taking a direct sight between these two uprights.

Bridge Wings.

Bridge wings 24 inches wide were extended out to the vertical projection of the sides of the vessel and were supported at the outboard end by wire rope guys attached to a common center in the mast allowing the wings to be readily swung aft on to the sides of the bridge when not in use.

Side-Lights Brackets.

The side-lights brackets were arranged very conveniently at the under side of the lower searchlight platform which was located on the inclined member of tripod mast and extended well outboard on either side. The lights were dropped into place through small hatches in the platform.

Armor Gratings.

Armor gratings in ventilation trunk openings were built up in complete units set in on supports in the opening, instead of each bar being set in loose, as in our practice. They were built of $\frac{5}{8}$ inch by $5\frac{3}{4}$ inch bars throughout including the frame, the bars being spaced about 3 inches center to center and supported at mid-length by distance peices of $\frac{3}{4}$ inch pipe over a steel rod running continuously through. The inner bars were flanged and riveted to the frame and in many cases one long bar was bent and flanged so as to form three complete bars in the grating. The upper and lower edges of the bars were rounded off to give less resistance to the passage of air. Gratings in protective deck openings other than uptake openings, and except where hinged for access were fitted in two tiers, the bars in the upper tier running athwartships and in the lower one, fore and aft. Gratings hinged for access were worked in single tier and it was surprising to see in a large opening in which three sections of grating were fitted, one single hinge section and two sections just alongside in double tiers. Gratings in uptake openings could not be inspected, but a small scale midship section plan seen at the dockyard, indicates that they are fitted single and of the same depth and construction as indicated above. It is believed that the fitting of the second tier of gratings in certain ventilation openings is an alteration in the original design, as the structure in which the grating is supported shows every evidence of this, and is probably a result of some happening in the Jutland Battle.

Torpedo Tubes.

The vessel was designed to carry one center line torpedo tube in the bow and two athwartships tubes in each of the forward and after torpedo rooms. It is understood that the vessel had been mined in way of the forward torpedo room, and that in making repair of the

damage the tubes had been removed and the space cut up into small compartments. The after torpedo room was a very large compartment, with about 14-foot headroom. The tubes were arranged to fire at a fixed angle of about 15° forward of the beam on either side. They carried 23-inch torpedoes and appeared to be of a rapid loading type.

Spring-Balanced Hatches.

Armored hatch covers were fitted with a crude spring balance arrangement, the spring being fitted in a cylindrical case and attached to a rod which pushed directly up against the cover near the hinge edge to open. The lower end of the spring case was supported on a bracket built out from a bulkhead, and in most cases projected into the line of the clear opening of the hatch.

Condition of Vessel's Bottom.

The underwater sides of the vessel to well below the turn of the bilges were completely covered with a heavy growth of barnacles from one-eighth inch to three-eighth inch in depth. The flat part of the bottom was about 50 per cent covered. If the vessel has been docked since her first trials about two years ago, one can safely conclude that the German antifouling paint does not compare very favorably with our Norfolk compositions. Information as to the date of last docking could not be obtained.

Riveting.

Pan and button head or snap points were used in very few cases. Practically everything except where a smooth surface was required was riveted with what appeared to be countersunk raised heads and points. Countersunk flat points, of course, were used at the outside of the shell. It might be possible, however, that what appeared to be countersunk raised heads and points were ordinary hammered rivets or Liverpools, but they seemed rather shallow for either of these types. There was no way of definitely determining this, or the size of rivets used in a given case.

Boats, Boat Handling.

The number and type of boats in use, and their stowage arrangement, are shown on plates and photograph referred to above. Diesel engines were used in admirals' and captains' barges. There was a boat crane located on each side of the vessel near the after smoke pipe, the mast post of which was similar in construction to that used on our latter battleships. The jib was stepped in a fixed pin bearing at the outboard side and wire-rope guys were used to support the jib head instead of rod guys. The hoisting gear consisted of a wire-rope drum operated by a large electric motor and was

located below deck about 50 feet aft of the mast, the rope fall being led over sheaves to the foot of the mast and then around sheave at the top. The only provision for turning the jib was by guys taken from the jib head around a deck winch. The jib had an outreach of about 15 feet beyond the ship's side and the fall point was roughly 65 feet above the water line. There were installed on each side of the vessel two revolving boat davits of latticed construction low enough not to interfere with turret gunfire, and arranged to take a fall on each end of the boat. These davits were evidently used for hoisting out and in the cutters. They were very strongly built and supported and the hoisting power was supplied by deck winches.

Searchlights.

There were platforms in the forward tripod for four 15-inch searchlights and in the aftermast for four. Only three searchlights were on board, however, when the ship reached Invergordon. Whether the others had been removed during salvage, by the Germans before interning the ship or by them while in service, could not be determined. They were of an old pattern, however, and if removed by the Germans for other purposes while the vessel was yet in service, it indicates, as far as they are concerned, the passing of the use of searchlights on battleships, their place being taken by star shells. Distant control for searchlights had been installed and remained at each of the eight searchlight bases. This was similar to the Chadburn rod and gear control.

Zinc Protectors.

Zincs were fitted on the leading edge of rudders on the plan of the center shaft strut and at end of each stern tube. None were fitted at sea chests. Those on rudder, stern tubes, etc., were $\frac{1}{2}$ inch by 9 inches by 15 inches.

Turret Arrangement, Etc.

In comparison with our 3-gun 16-inch turrets, the *Baden's* turrets are enormously large for the size and number of guns carried. The barbette has an outer diameter of 35 feet 2 inches and the turret an overall height of 9 feet 5 inches and width of roughly 30 feet. The roof has a flat surface 37 feet 6 inches long by 15 feet 6 inches wide. Turret overhanging, 10 feet.

The height of the heavy vertical front plate at center of the turret is 5 feet, the surface of the 8-inch inclined front plate measuring vertically 9 feet 3 inches. The 7-inch shelf plates at the sides of the turret extend out to the vertical projection of outer face of the barbette armor and are 38 inches at the greatest width.

Turret foundations are built of 30-inch plate stiffened around the outer side by built-up stiffeners spaced about 3 feet 3 inches. The turning rack is bolted to the inner face of the foundation ring just under the ball track. In turret No. 4 the ball track support is secured to the inner face of the barbette armor. This is not the case, however, in the other three turrets, there being about 9 inches between the face of the armor and the outer edge of the track support at the top.

The turret was carried on 8-inch diameter balls spaced about $9\frac{1}{2}$ inches center to center. The lower ball path appeared to have been machined to allow contact of ball over about 60 degrees of its circumference, while the upper path appeared to have been machined for a point contact, the contact being at the outer side of the ball and at an angle of about 25° from the vertical. Access to the ball space was so very poor that no measurements of the ball grooves or the track pieces could be made, neither was it possible to get to the holding-down clips, which it is assumed were arranged to grip around the outer side of the lower track. The turning gear consisted of a rather small-sized motor attached to the underside of the turret pan, driving a cross shaft through bevel gears direct, the cross shaft disappearing into a rather bulky gear casing near the pinion on each side. As there was no means of getting into the casing, the gearing could not be examined. It is understood, however, that it was of a friction type. It was certainly not of an oil-driven type of speed control.

There was an oval-shaped door fitted in the barbette armor of each barbette between the second and main decks, used apparently for taking in ammunition transferred from forward magazines to after magazines or vice versa, and for under-deck access for turret crew. It is believed that the latter is the principal purpose of the openings. The crew space is on the second deck and there would be considerably less trouble and confusion in taking station via this route than by weather deck route.

The turret with the ball-bearing arrangement, also with the track attached to or so near the face of the barbette armor, is peculiarly vulnerable to being jambed. There are also four very soft spots in the protection, first, the 8-inch front and $4\frac{3}{4}$-inch roof plates inclined very nearly normal to the fall of the enemy's shot; second, the 7-inch horizontal plates at the turret sides over the barbette top; third, the enormous area of the flat roof covered by $3\frac{15}{16}$-inch armor; and fourth, the 4-inch, 3-inch, and 1-inch barbette between second and third decks which is in line with the fall of a long-range shot coming from the beam and entering the main deck outside of the casemate armor.

It is regretted that more details of the turret gear could not be obtained, due to lack of light and poor access.

Pumping, Drainage, and Flooding Systems.

Plates Nos. 18 to 36, inclusive, will show the general arrangement of the pumping, drainage, and flooding systems, including the magazine flooding. The magazines are flooded from the sea through very large sea openings in way of the magazine spaces. Drain valves are worked in the floor of each magazine and are connected back into flooding pipe, and it is believed that in flooding, both the drain and flood valves are opened, thus flooding the floor at the same time the sprinkling is taking place over the ammunition. The air space or explosion compartment, at the sides of the vessel, is flooded through large sea chests of the scoop type. These sea chests are spaced on an average of one in every fourth compartment on each side. The compartments not fitted with the chest for direct flooding from the outside are flooded through sluice valves at the bottom of the transverse bulkhead. No equalizing pipes are fitted between compartments on opposite sides of the vessel. The shell opening for these sea chests was, roughly, 2 feet square, fitted at the shell with a casting hinged on the after edge and forming at the same time a strainer or grating about 8 inches deep at the forward edge and a frame over which a steel plate was riveted. When this scoop was closed in the steel plate was flush with the shell plating and made a fairly good fit. When opened, the forward edge projected about 7 inches to 8 inches outside of the shell. The opening and closing of the scoop and sea-chest valve was done from the second deck, as was also the sluice valve in the transverse bulkhead. As far as could be determined, there was no centralized control of either the sea-chest valves or the sluice valves. The air-escape valves to these compartments were located at the second deck, near the operating gear for the sea chest and sluice valves. The drainage of sanitary systems, decks, etc., was done in about the same manner as in our practice. Scuppers for sanitary systems pierced the main armor belt just above the water line.

The main drains in the engine and boiler rooms were operated by the main and auxiliary condenser pump and were so arranged that these compartments could be flooded very rapidly from the sea. A large portion of the forward and aft ends of the vessel were arranged to be flooded through large diameter pipes direct from the sea for trimming purposes.

Ventilation.

General arrangement of ventilation systems is shown in some detail on plates Nos. 37 to 49. Special attention is drawn to the fact

that the ducts in many cases passed horizontally through water-tight bulkheads also; that in the vertical ducts branches are taken, off at the successive deck levels, the water-tight subdivision depending upon butterfly valves worked in each branch. These valves were not considered either dependable or water-tight.

Lines.

Body plans and half-breadth and profile plans, scale $\frac{1}{8}$ inch equals 1 foot. The above drawings were made from small scale general arrangement plans found on board the *Baden*. Five sections of the vessel were actually measured up and measurements taken from the small scale plans faired into the sections which were actually measured. The actual measurements showed very little difference, either one way or the other, with the measurements taken from the plans and the lines as constructed thusly can therefore be taken as fairly accurate. The Admiralty have towed without appendages a model of the vessel, and they find that the resistance up to 16 knots compares very closely with that of the *Royal Sovereign*, which is of about the same size and displacement as the *Baden*. Above 16 knots, however, the resistance begins to run higher than the *Royal Sovereign*, and at 21 knots is considerably higher. The *Baden*, when floated out of the dry dock at Invergordon, had a draft of 29 feet 6 inches forward, and 27 feet 10 inches aft, or a mean of 28 feet 8 inches and a corresponding displacement of about 29,200 tons.

There was roughly 1,000 tons of water in the vessel at this time, and while no actual measurements have been made of the coal and oil on board, it is believed that 250 tons would cover this. There was no ammunition on board. There was a small amount of provisions and stores in the storerooms, but the weight of the missing crew's effects, gun breech equipment, and fire-control instruments, etc., would more than equal the weight of the stores. It will therefore be seen that, with the exception of the water and stores on board, the ship was in a condition corresponding to what we term "the light condition." It is believed that the ship was built considerably over her designed weight, but this could not be definitely stated in the absence of any accurate measurements of the water, coal, and oil on board, which it was impossible to obtain at the time.

The load water line of 27 feet 8 inches mentioned in this report and shown on midship section, was taken from drawings found on board the vessel and is assumed to be the designer's water line for the trial condition of the vessel. The amount of stores, fuel, and ammunition carried on trial is not known here.

AVIATION.

BRITISH NAVAL VIEWPOINT ON SEPARATE AIR SERVICE.

Source: Reliable.

1 June, 1917.

(8534)

Personnel.

The system adopted for the training of Naval aviation personnel should be entirely separate and distinct from that adopted for the Army aviation training. Most British naval officers are unanimous in this contention. Many examples were cited of instances in which flying officers trained with the Royal Flying Corps and, after the amalgamation of this corps and the Royal Naval Air Service, detailed for duty with ships of the Grand Fleet, scout cruisers, seaplane carriers, etc., failed in the missions assigned them because of their fundamental lack of knowledge of seagoing practices and of sea conditions. It was pointed out that the flying personnel operating with the Navy, to perform their duties with intelligence and efficiency, must have an intimate knowledge of the element over which they fly and of the various craft which operate in this element. Only with this knowledge could the best results be obtained. One prominent British admiral, an officer particularly qualified to voice an opinion on the subject, said that naval aviators on board ships should not be specialists in any greater degree than turret officers and should be qualified at all times to carry on the ordinary line duties of the regular service.

Operations.

It is contended that one of the most important functions of naval aircraft is to perform for the naval fleet, in the air, that which the scout cruiser performs on the water. It would naturally follow that the operation of such aircraft should be entirely controlled by a naval organization, the one body qualified to coordinate the activities of all craft cooperating with but subordinate in importance to the ships of the first line, whether operating above, below, or on the surface of the water.

Production and Supply.

It is generally agreed that, from a standpoint of production and supply, many arguments may be advanced in favor of a combined

air force. In general, the jurisdiction of such an air force, however, should extend only to matters affecting commercial aviation and should have no voice in the control of military or naval air operations or in the training of service personnel. Experimentation, production, and supply in general, development and research work, drawing up of general rules for the qualifying examination of civilian pilots, control of the air post, aerial survey work, the obtaining of meteorological data, etc., are activities which might well be allotted to such an organization.

Design.

Separate designing departments, one for army and one for naval aircraft, should be established.

Economy.

The cost of the maintenance of the combined air force is believed to be too great a drain on the Government's revenue. Aviation activities could be controlled with far greater economy if operations were conducted under separate organizations.

Future.

The hope was unanimously expressed that the control of naval aviation activities would ultimately revert to the Navy.

Concerning the attitude of the Navy at the time of the proposed amalgamation of the Royal Flying Corps and the Royal Naval Air Service and as to the arguments advanced to defeat the establishment of the Air Force, there are the following comments:

(*a*) Such strong feeling was brought to bear in favor of a combined air force by the press, politicians, and many leaders of the Royal Flying Corps and such rush measures were adopted in legislation that the proposition was forced upon the Navy before definite arguments against the scheme could be presented.

(*b*) It is agreed that certain peculiar conditions existing at the time of the amalgamation tended to strengthen the arguments in favor of the combined air force, and the following is an example: Naval pilots were flying land machines and performing, in many cases, the functions of Army pilots (this statement applies particularly to the work done by Royal Naval Air Service pilots in northern France, where the bombing of Bruges, Zeebrugge, and Ostend, German ammunition dumps and troop concentration points in the interior was quite consistently carried out). As the work which this particular personnel was engaged in was of great military importance and as their cooperation with the Army and the Royal Flying Corps was so intimate,

it was believed that their activities could be better controlled under an air force than under a naval organization.

(*c*) In general, the rôle played by the Royal Flying Corps during the war was of vastly greater importance than that played by the Royal Naval Air Service, and the establishment of an air force could disturb but little the existing Royal Flying Corps organization. As a consequence, the idea was favored by them, which fact was accentuated by politicians and the press.

The following comments pertinent to the British naval viewpoint are considered relevant:

The British naval viewpoint as regards personnel is concurred in with the exception of the opinion that officers specializing in aviation should be qualified to carry out ordinary line duties of the regular service. The development of aviation has been so rapid during the last few years that as an art and a means of conducting warfare it has established itself as one of the strongest arms of a nation's defense. It is reasonable to predict that, owing to competition and struggle for air supremacy, it will continue to develop for years to come, and it would appear incumbent upon the officers who associate themselves with this branch to keep in stride with the development to the end that when their period of usefulness as actual fliers has expired, they may be qualified to carry on in an administrative capacity and with full knowledge of the degree of perfection the art of aviation may have at that time attained. It is not believed that this result can be obtained by requiring the aviation officer to perform, in addition to the duties of his specialty, regular line duties, although the necessity for general knowledge of the fleet and fleet work is conceded.

The opinions expressed under operations, production and supply, design, economy, and future are concurred in.

General Comment.

In considering the broad question as to the advisability of combining the air forces of the Army and the Navy at this time, too much stress can not be laid upon the conviction that while perhaps the Army is ready for such an amalgamation, the Navy is not. Vast experience in practically every phase of Army aviation work has been obtained and the value of the land reconnaissance machine, scout, fighter, and bomber clearly demonstrated under war conditions. Desperate competition for air supremacy on the western front has been responsible for the rapid development of Army aircraft. No such field of activity was open to naval aviation, and, in short, no real wartime experience obtained relative to the value of the

fleet reconnaissance machine, torpedo plane, or of any aircraft operating with the fleet and flown from the decks of men of war. The general activity of naval aviation, owing to the peculiar conditions of the war, was restricted to searching for and hampering the movement of German submarines.

On 31 March, 1918 (the date of the amalgamation) the strength of the Royal Flying Corps and the Royal Naval Air Service was as follows:

Number of officers in Royal Flying Corps	19,000
Other ranks	140,000
Number of officers in Royal Naval Air Service	5,500
Other ranks	50,000

Inasmuch as a very high percentage of the personnel of the Royal Naval Air Service was employed in Army aviation work, the above figures are not a measure in man power of the relative importance of the work in which the services were engaged.

Naval aviation has a vastly greater development period ahead than Army aviation for reasons above stated and should, it is believed, at least for this period, be under Naval control.

AVIATION, JAPAN.

Organization.

Until recently the aviation of the Japanese Army consisted of two battalions attached to the communication brigade. In July, 1919, however, a separate air service was created as a bureau of the War Department.

The chief of the air service is a major general. He has under the bureau at the War Department five field officers who do administrative work; working in conjunction with him, but not under his administration, are several field and company officers, who are detailed for a short time to the work.

The active part of the air service is organized into battalions, each battalion being assigned a separate district with its own shops, fields, etc. Each battalion has 3 companies of about 100 men each. It is the intention of the War Department to have 10 such battalions completed by 1926. At the present time the first and second battalions are completed, the third is just being started, and the fourth has organized one company. Each battalion will be under a lieutenant colonel or a colonel, who will also control the field at which the battalion is stationed. The companies will be commanded by captains or majors. A major will serve as field adjutant. The proportion of officers per battalion will depend upon

the success of the present policy of developing sergeant pilots. Should this succeed, the number of officers per battalion will be relatively small; in case of failure, the number of officers per battalion will be much greater. At the present time 75 per cent of the aviators are first lieutenants, about 10 per cent captains, and the remainder of noncommissioned rank.

Strength.

At the present time there are probably 200 officers, 1,500 enlisted men, and 1,000 civilians connected directly or indirectly with the air service of the Japanese Army. Of these, nearly 200 are pilots; that is, they can get a machine off the ground—there are not more than two or three good pilots in the whole army.

All officers serving with the air service are on detail—that is, they hold commissions in other branches of the service. The enlisted men belong to the engineer corps.

Distribution.

The present distribution of the first four battalions is as follows:

First battalion, Tokorozawa, near Tokyo.
Second battalion, Kagamigahara.
Third battalion, Yokaichi, in Miya prefecture, near Nagoya.
Fourth battalion, Tachiarai, in Fukuoka prefecture.

It is thought that the fifth battalion, when formed, will be stationed in Sendai, in Miyagi prefecture. When the full program is completed, there will probably be one battalion in Hokkaido, one in Korea, possibly one near Tsingtao, three in Hondo, two in Kyushu, and two in Shikoku.

Efficiency.

The Japanese is naturally unfitted for any mechanical pursuit, and for this reason great difficulty has been experienced in training aviators. After two years of flying, Japanese aviators are unable to perform stunts, and still make poor landings. Elemental things, such as lubrication, are often neglected; poor workmanship in avions and engines, and a naturally slow nervous reaction—all these have combined to cause terrific casualties in the Japanese air service. Fully 40 per cent of Japanese pilots are killed in the air; this condition has led to a natural unwillingness to enter the air service on the part of the officers. All officers have to be detailed, as practically none will volunteer; recently substantial increases in pay have been granted to men serving with the air service, amounting to 50 per cent; and a bonus of 10,000 yen is paid to the widow of a pilot killed while flying. However, for some time to come great difficulty will be experienced in obtaining officers.

A foreigner watching Japanese flyers is struck with their lack of common sense; they make cross-country flights at a height of 200 feet, over a terrain that contains absolutely no suitable landing places; they land, in a high wind, close to buildings and trees, so that they are blown into them; they skim the tops of mountains, without thinking of possible dangerous air currents.

Training.

Up to the present time the only training place for Japanese aviators has been with the air battalions. However, on December 1, 1919, an army flight school will be opened. This school will be available for officers and noncommissioned officers of the army and for civilians between 17 and 20 years of age. The civilians will be subjected to an entrance examination similar to that given in the army cadet schools. Nothing is known of the course to be given in this school, but it is presumed that such civilians, having completed the course, will be commissioned in the air service.

Training in the following subjects is given in the battalions at present:

Mechanics.	Aerial photography.	Map making.
Flying.	Wireless telegraphy.	Signalling.
Bombing.	Machine guns.	

But most of the subjects mentioned above are treated in a very elemental manner.

In January, 1919, a French aviation commission of 60 officers and noncommissioned officers came to Japan for the purpose of instructing Japanese aviators. They brought with them several modern machines, and more followed them. They worked until July, and half of them are still there (September, 1919). They represented all branches of the air service, and were thoroughly competent instructors, but on the whole they have not made much progress with the Japanese. No successful chasse pilots have been developed, though unquestionably the general average of flying has been improved by their instruction. The Japanese Army officer is very proud, and loath to accept instructions from foreign officers. This fact, and the natural inaptitude for such matters, has retarded progress, but perhaps in the future good results will be more apparent.

Equipment.

According to the best information, the air service of the Japanese Army has at present the following machines available:

Two hundred Maurice-Farman two-seater pusher biplanes, model of 1914 (modified), equipped with (*a*) an 8-cylinder, 100 horsepower Japanese motor, or (*b*) a 6-cylinder Daimler type motor of 100 horsepower, manufactured in Japan. These planes and their en-

gines are manufactured complete in Japan. This plane has a span of about 35 feet, a chord of about 7 feet, and the top plane has an overhang of 4 feet on each side. Wing-tip ailerons are used. The fuselage is about 28 feet long, and the nacelle projects about 5 feet in front of the planes. Observer sits in front, pilot behind him, engine behind and above the pilot. Planes are not staggered. Both engines supplied are of poor quality, giving a maximum speed of only 70 miles per hour, and a landing speed of 35 miles per hour. This is probably the worst aeroplane in active service in the world to-day. However, it is the standard Japanese training and service plant, and about 200 are available at present, although most of them are in wretched condition.

Thirty Standard biplanes, 150 horsepower, Hall-Scott, 8-cylinder motor. A modern two or three passenger tractor, with a speed of 100 to 110 miles per hour. This is the standard Post Office Department mail plane in the United States. The motors are imported from the United States, but the fuselage, wings, nacelle, and under carriage are manufactured in Japan. This modern plane is intended for straight or long-distance flying, but the Japanese have been trying to adapt it to a chasse and stunt work, with very little success.

Seventy-five Sopwith biplanes, of two types: The Pup, a single-seater scout, with an 80-horsepower, 9-cylinder LeRhone motor; the Camel, a 2-seater scout, with a 110-horsepower, 9-cylinder LeRhone motor. These fine tractors are especially suitable for Japan, because of their lightness and low-landing speed. Both the Pup and the Camel were standard planes of the British and French Armies. Fifteen of these planes were bought, complete, from the French Government, and 60 extra motors were obtained at the same time; the wings, fuselage, under carriage, and nacelle are being manufactured here for the extra motors.

Ten S. P. A. D. tractor biplanes, of two types: (*a*) Single-seater scout, two guns, 225-horsepower Hispano-Suiza motor; (*b*) two-seater fighter, three guns, 320-horsepower Hispano-Suiza motor. Both these types of Spads were standard with the French Army. These machines are second hand, and were sent direct from the western front. They are complete in every detail, guns, instruments, and even maps being still mounted. However, they are not in the best of condition, and the engines are probably pretty well worn out. They are unsuitable for Japan, because of their great weight and high-landing speed.

Twenty Nieuport tractor biplanes, of two types: (*a*) Single-seater scout, one gun, 15-meter wing spread (the famous Neuport 1½ strutter), 225-horsepower Hispano-Suiza motor; (*b*) 2-seater fighter, two guns, 23-meter wing spread, 225-horsepower Hispano-Suiza. These

planes were sent by the French Government direct from the western front, and are completely equipped but very second hand. It is thought that the Japanese will attempt to manufacture this Nieuport 15-meter scout, but they will be hampered by lack of suitable motors.

Six Breguet night and day bombers. We have no definite information about these planes; they have just arrived in Japan and no member of this office has seen them. It is thought, however, that they are 2-engine machines of large carrying capacity, and we know that one, at least, has two Liberty motors mounted, and another two 12-cylinder Sizaire-Naudine motors. These machines were obtained, complete, from the French Government; they are second hand and have seen considerable service.

The following motors and planes have been ordered by the Japanese Government, but are not yet delivered:

Ninety S. P. A. D. tractor biplanes, similar to those described above. They are second-hand machines. These have been ordered from the French Government.

Seventy Hall-Scott 9-cylinder, 150-horsepower motors for the standard biplane. These are under order from the United States, but have not yet been delivered. Wings, fuselage, under carriages, etc., are being made in Japan.

Landing Field.

Japan is a small country with a large population, and as yet the nation is mainly agricultural. Therefore all portions of the country not heavily wooded or mountainous are under cultivation; nearly all the crops raised are irrigated (rice in particular), and the holdings are invariably small; no fences are used, but narrow ditches divide one man's property from another's. It will readily be understood, therefore, that good landing places are practically nonexistent, and an aviator making a forced landing in Japan is in great danger.

The army has now two good landing fields, well grassed and large in extent; these are at Tokorozawa and Kagimigahara. Another large field is practically finished near Kobe, and two smaller ones are under construction. Outside of these places there are no fields suitable for landing aeroplanes in the country; in many places, however, the sea beach provides a restricted landing place.

Building Facilities.

All engines for Japanese planes are built in the arsenals in Tokyo and Osaka; these arsenals are very large, employing from 40,000 to 60,000 work people. Wood working, canvas stretching, doping, and painting, are done at Tokorozawa, where 500 civilians are employed for this purpose. Lately some work has been done at Kagamigahara.

The Japanese are unable to manufacture certain parts, as Japanese steel is not yet of very good quality; all aeroplane wire, crank shafts, etc., have had to be imported. The next few years, however, will undoubtedly see great development along these lines, and soon Japan will be in a position to build her own motors and ships without having to import any parts.

Civilian Aviation.

The newspapers have recently announced the institution of an aerial mail route between Tokyo and Osaka to be started October, 1919. The service will be maintained by four aeroplanes (Standards, with Hall-Scott motors), and it is expected that trips in each direction will be made every other day. This enterprise is a purely civilian one, although Gen. Nagaoka is said to be backing it. According to French officers and others who are well up on aviation matters, the venture is doomed to failure. The reasons given are (*a*) lack of machines, (*b*) lack of civilian aviators, and (*c*) lack of landing places. Between Tokyo and Osaka there are but two places suitable for the landing of aeroplanes, at Hammatsu and at Kagamigahara. The latter place is off the direct route between the two towns. Should this aerial mail service prove a success, which is highly unlikely, no doubt others will be instituted, but the configuration of the country will prevent suitable landing places being found.

There are at present in Japan not more than 10 civilian aviators holding pilot's licenses.

AVIATION, U. S. ATLANTIC FLEET.

Source: Reliable.

17 November 1919.

On Wednesday, November 12, 1919, the entire detachment, including *Shawmut*, left the navy yard, Philadelphia, Pa. Six F–5–L's reached Delaware breakwater about noon. Close formation exercises were held en route, flight being made in two hours.

Shawmut arrived Delaware breakwater at 3.59 p. m., anchoring near outer breakwater.

Following morning at dawn, *3665* went alongside *Shawmut* for fuel. A squall came up from astern and before plane could be gotten clear of ship, it was blown against stern of *Shawmut* and the upper left wing tip damaged. Other planes were ready to take off, but waited for repairs to *3665*. A north storm wind came up about 8 o'clock, making it necessary to taxi all planes to a more protected anchorage near the breakwater. In going alongside *3601* to take off the crew, the motor boat damaged the right wing, owing to the strong

tide, rough water, and high winds. Wind increased during the day and continued all night at about 40 knots velocity. This made it impossible to effect repairs during the day. In spite of the high winds all planes rode safely to the 75-pound anchor. On Friday, November 14, repairs were completed to the two damaged planes, and on Saturday, November 15, all machines proceeded to Hampton Roads, Va., making the flight of 137 miles in two hours.

Some difficulties were encountered during this flight. *3662* was forced to land shortly after taking off under peculiar circumstances. Joints in the water system had been made up at the aircraft factory with shellac. The water pump joint in the port engine had apparently not been set up tight. A small percentage of alcohol had been placed in the radiators the previous night to prevent freezing. and, after running for a short time, this alcohol dissolved the shellac, causing a bad leak. *3601* landed shortly after taking off with a faulty port motor, due to a loose carburetor choke. *3603* was forced to land because of trouble in one motor, the cause of which has not been definitely determined. All machines arrived at Hampton Roads without mishap.

This trip was in the nature of a "shaking down cruise," and the troubles encountered, although not expected, were not serious, and all machines were able to reach destination without outside assistance.

U. S. NAVAL AVIATION—MISCELLANEOUS NOTES.

Source: Reliable.

12 November 1919.

General.

Maps are being prepared showing location of all proposed or existing Army, Navy, and Post Office air stations and landing fields, copies of which will be furnished the Post Office Department, the House Naval Committee, the General Board, the Naval Planning Board, and the Coast and Geodetic Survey.

Operations.

The commander in chief Atlantic Fleet desires to operate six kite balloons from the beach at Guantanamo during the southern cruise. For this purpose portable gas plant, necessary compressors, hydrogen bottles, and six kite balloons will be shipped from Hampton Roads about the time the fleet goes south.

The static thrust of the Loening M–8–O was determined yesterday at the naval air station, Anacostia. At 1,580 revolutions per minute, using a propeller 8 feet 8 inches in diameter and 7-foot pitch, the static thrust is 1,070 pounds; at 1,700 revolutions per minute, using

a propeller 9 feet 3 inches diameter and 5-foot 3-inch pitch, the static thrust is 1,120 pounds. Using the 8 feet 8 inches diameter propellor, a short flight was made by the Bureau of Construction and Repairs test pilot, Lieut. Newman. This flight was witnessed by Mr. Loening, of the Loening Aeronautical Engineering Corporation; Mr. Crane, of the Wright-Martin Co.; Gen. Mitchell, of the Army Air Service, and various members of his staff, and Air Service officers, and representatives of the Bureaus of Ordnance, Operations, and Steam Engineering.

Heavier-than-Air.

On 24 November three HS–2L flying boats made a trip to the San Blas Islands in the Republic of Panama. No difficulty was experienced on the entire trip with the exception of a forced landing by HS–2L *No. 1927* near Le Grande Light, 39 miles from the station. This was caused by the generator failing to function, resulting in a short circuit. Owing to the high sea running at the time, a hole was torn in the bottom of the hull on landing. Sub chaser *No. 282* was sent out immediately, but, as it was deemed impracticable to tow the plane to the station, it was beached.

The following day the sub chaser returned with a full crew and complete equipment of landing gear, such as trucks, planking, winch, and spares for both motor and plane. Carpenters carried all necessary gear with which to repair hull. The gear was floated and landed inside of two hours. Another hour was required to beach plane, and all repairs were completed on hull in three hours. Motor repairs occupied an hour more, making a total working time of seven hours before plane took off and flew back to the station. This is considered record time for such an extensive operation.

Towing planes for any distance has proved disastrous in the past, usually resulting in damage greater than the original trouble. Repairs made in the above manner are entirely satisfactory and required but little more time, the plane then being ready for use instead of being laid up for extensive overhaul.

Communication by radio and pigeons was maintained throughout the trip.

Three HS–2L boats made a flight to the Perlas Islands in the Pacific and return. Weather conditions were favorable except between Gamboa and Gatun, where a heavy rainstorm was encountered. It was found on landing that the leading edges of the propellers were worn down a half inch. The 180-mile flight was made without difficulty.

INTERCOMMUNICATION ON AIRPLANES.

Source: Reliable.

1 December 1919.

The problem of intercommunication on airplanes has been temporarily solved at the United States Naval Aircraft Radio Laboratory, Anacostia, D. C. There is applied to the microphone transmitter 12 volts instead of 6 as originally used. In tests conducted while on flight constant communication was maintained between four persons. A disconnecting devise such as a push button, to alleviate the danger of burning out, is required in order that the current may be cut off from the microphone when not in use, due to excess current.

The United States Naval Aircraft Radio Laboratory, Anacostia, D. C., has submitted recommendations covering the standardization of a new type compass coil developed at that laboratory. It consists of a single-coil system instead of the two-coil system previously used. In view of the fact that less apparatus is needed to successfully operate this coil, the weight of the total direction-finder system as installed upon planes will be cut down nearly 35 per cent.

INTERNATIONAL CONDITIONS.

UNITED STATES AND FINANCIAL QUESTIONS IN CHINA.

Source: Reliable.

20 November 1919.

(12168)

Early in the year 1909 a group of American bankers, consisting of J. P. Morgan & Co., Kuhn, Loeb & Co., the First National Bank, and the National City Bank, was formed for the purpose of taking up the participation to which American capital was entitled in the Hukuang Railway loan, then under negotiation between the Chinese Government and the British, French, and German financial groups. This group, working with British, German, and French financial representatives, negotiated and signed with the Chinese Government on May 20, 1911, the Hukuang Railway loan agreement.

The interest of American financiers in Chinese loans antedated, however, this Hukuang loan agreement, having its beginning in negotiations with the Chinese Government in connection with the establishment of a Manchurian bank for the purpose of assisting in development work in Manchuria. The Manchurian development project acquired a more extensive scope during the course of negotiations, proposals being made for a large loan utilized in a program of industrial development, currency reform, and the financing of the Chinese administration during the period which was to follow the abolition of Likin, and until the consent of all of the powers to an increase in the customs tariff should be obtained. So it was that the original American financial group, then engaged in negotiations at Peking concerning the railway project, entered, independently of the other parties to those negotiations, into a preliminary agreement with the Chinese Government on October 27, 1910, for a currency loan in a sum not to exceed $50,000,000 (United States currency). Upon the solicitation of the American group, the Chinese Government consented to the participation in the currency-reform loan of the British, French, and German banks with which the American group had associated itself for the purpose of China business, thus forming the so-called four-power consortium. This, the original consortium, entered on April 15, 1911, into the final agreement for the currency loan, which was to be for a sum not to exceed £10,000,000.

Four-Power Consortium; Great Britain, Germany, France, and United States; 1911.

Before a satisfactory arrangement could be made for the flotation of this currency loan, however, there intervened the outbreak of the rebellion against the Manchu dynasty; and under the altered conditions which thus resulted, the consortium postponed further action on this project in order to undertake a reorganization loan urgently required by the newly established republican Government. Article 17 of the currency loan agreement provided that in case conditions arose making it impossible to float and issue the loan successfully under the terms provided by the agreement, the banks would be granted an extension of six months within which to carry out their contract. It was also provided that this period might be further extended; and the banks concerned have made use of the privilege thus granted and have at intervals of six months each renewed their option to complete the loan. The last interval expired on October 14 of this present year.

Formation of Sextuple Group Comprising Great Britain, Germany, France, United States, Russia, and Japan, 1912.

The proposal for a reorganization loan brought into prominence the general international interest in Chinese finances. This Government, for its own part, continued to favor the fullest possible cooperation among the interested nations in Chinese loan matters. The reorganization loan as well as the currency loan involved financial measures intimately connected with the provisions which were written into the new Chinese commercial treaties of 1902–03, with Great Britain, Japan, and America, chiefly in connection with the abolition of Likin and the establishment of a uniform national currency by the Chinese Government. So that, after the conclusion of the currency reform loan of April, 1911, when the Japanese and Russian Governments requested the admission of their respective banking interests to participation in the business of the consortium, an arrangement for cooperation among the banking groups of the six nationalities, with respect to loans for administrative though not for industrial purposes in China, was discussed at an inter-banking conference held at Paris. This conference resulted in an inter-bank agreement which was signed June 18, 1912, and to which was attached the following minute, formulated by Mr. Verstraete and Mr. Takeuchi, embodying the claims of the Russian and Japanese Governments:

> In the event of the Russian or Japanese groups disapproving of any object for which any advance or loan under the agreement shall be intended to be made then, if such advance or loan shall be concluded by the other groups or any of them and the Russian or the Japanese Government

notify the other Governments concerned that the business proposed is contrary to the interests of Russia or Japan, as the case may be, the Russian group or the Japanese group, as the case may be, shall be entitled to withdraw from the agreement, but the retiring group will remain bound by all financial engagements which it shall have entered into prior to such withdrawal. The withdrawal of the Russian or the Japanese group shall not effect the rights or liabilities of the other groups under the agreement.

This minute was accepted, subject to the following declaration by the British, German, French, and American groups:

The same right of withdrawal mutatis mutandis is reserved to the British, German, French and American groups.

Withdrawal of American Group from Consortium, 1913.

The sextuple group thus formed proceeded with the negotiation of the reorganization loan; but while negotiations were still in progress, a change of administration of the Government of the United States led the American group to seek assurances of the active support of their Government through an inquiry whether the new administration would request them to participate in the proposed loan. The administration declined to request the group so to participate; whereupon the American group withdrew from further participation in respect to the currency loan and the reorganization loan and advised the other members of the consortium that, notwithstanding their withdrawal, "we shall like all other parties to the sextuple agreement be bound by provisions thereof until its termination, and neither the American group or any of its individual members would consider undertaking any Chinese business either directly or indirectly in competition with other parties to the sextuple group agreement as long as agreement remains in force."

The Quintuple Group of 1913.

The quintuple group thus remaining completed the negotiations for the reorganization loan, and on April 26, 1913, signed an agreement for a loan in the sum of £25,000,000. This loan was secured by the Chinese salt revenue, which were to be reorganized with the assistance of foreigners. The outbreak of the war, in 1914, brought about a situation which made it difficult to float large loans for China. There ensued a period during which a number of independent industrial and other loans were made.

Period of Independent Industrial Loans and Proposal of American Government for Organization of New Four-Power Consortium.

Following China's declaration of war against Germany in August, 1917, the question of supplying the Chinese Government with funds with a view to assisting it to take a more prominent part in the war came up, and the Department of State in June of the follow-

ing year called together a number of American bankers, who were interested in Chinese finances, for the purpose of considering with them the question of making a loan or loans by private banking institutions to the Government of China. As a result of this conference it was suggested that a consortium composed of banking groups of the four powers—Great Britain, France, Japan, and the United States—be organized by the respective Governments for the purpose of making loans to the Chinese Government. A group of American bankers was organized for the purpose of cooperating with banking groups of the other Governments, the conditions being that the terms and conditions of each loan be submitted to this Government, the cooperating Governments, and the Chinese Government for approval. It was also suggested that a condition to membership in the group should be the relinquishment to it of existing options to make loans; and it was the opinion of the American bankers that the arrangements for the proposed loan or loans should be made on the broadest basis possible. A letter from the American banking group setting forth their views of the matter, under date of 8 July, 1918, and the department's reply thereto, were communicated to the British, French, and Japanese Governments through their embassies at Washington on 10 July, 1918, with the idea that a four-power consortium should be formed composed of banking groups of the four nationalities.

It later developed that there were certain points which were not clear to the powers concerned; and, with a view to making the position of this Government on those points perfectly clear, a note to that end was submitted to the British, French, and Japanese Government, under date of October 8, 1918, in which the department stated that it was the idea of this Government to make the American group representative of the whole country, and to include such banks as had a present interest in China as well as those which might desire to join the group and might be acceptable to the other members of the group and to this Government. The department stated, however, that it was considered to be a reasonable condition to membership in the American group that all preferences and options for loans to China held by any member of this group should be shared by the group as a whole, and that all future loans to China involving Government guarantee should be conducted in common as group business; and that it was the intention that all loans of the American group should be automatically shared with and conducted in common by the international group. The department explained that it was the earnest hope of this Government and the other Governments which were largely interested in China and in a position to render substantial assistance at this time—namely, France, Great Britain, and Japan—might see fit to join with this

Government in the proposed plan, and consent to the formation of similar national groups, organized on the same basis, to cooperate with the American group; for it was and is the firm conviction of this Government that only by such cooperation and upon such principles could the best results be obtained for China and for the common interests of the other powers concerned. It was explained further that the United States Government in making this proposal was not unaware of the so-called "Five-power consortium" nor was it its purpose, in suggesting the formation of a new consortium, to interfere with any of the rights of that organization. It was hoped, however, that as in the case of the American group, the new national groups to be formed might be made so broad as to include the members of the former consortium as well as others who had legitimate claims to such inclusion.

In a memorandum which the department inclosed with its communication of October 8, it explained that it was not intended that the American group should rejoin the existing consortium, but that there should be organized a new international group. With reference to the proposal for "a relinquishment by the members of the group either to China or to the group of any options to make loans which they now hold," it was explained that this Government had in mind primarily conditions to membership in the American group alone, for it was considered that such relinquishment was a reasonable condition of membership in the American group. And while it was recognized that each interested Government must necessarily make its own arrangements with its own national group, it was admitted that it would probably be possible to conduct the business of the international group only by similar relinquishment by the individual banks in their respective national groups without distinction as to the nature of the options held. The department stated further that the proposal of this Government contemplated that industrial as well as administrative loans should be included in the new arrangement, for the reason that in practice "the line of demarcation between these various classes of loans often is not easy to draw. Both alike are essential fields for legitimate financial enterprises and both alike should be removed from the sphere of unsound speculation and destructive competition."

Bankers' Conference at Paris 10–12 May, 1919, After Proposals Were Accepted by the Powers.

The proposals thus set forth by the Government were cordially accepted in principle by the powers concerned, but on February 11, 1919, four months after the communication of this Government's note and memorandum of October 8, 1919, it was learned that the Japanese Government had not advised its bankers thereof. It

appears that the Japanese bankers first learned of the details of the American proposal through Mr. John Jay Abbott, who met with them while on his way to China and found them favorably disposed toward the plan.

As late as April 2, 1919, the Japanese Government informed the American Embassy at Tokyo that it was not then prepared even to authorize a Japanese banking group to participate in a proposed preliminary conference of bankers until its cabinet could reach a formal decision in regard to the American proposals.

The Japanese Government finally acted, however, and on May 10, 1919, there was convened at Paris a conference of the representatives of the national groups of France, Great Britain, Japan, and the United States.

This conference adopted certain resolutions and entered into an agreement which was subsequently submitted to the Governments of the four nations concerned for their acceptance and approval. It was resolved among other things to accept the principles laid down for the formation of the new consortium for Chinese loan business in the note dated July 11, 1918, addressed to the British, French, and Japanese Governments, and in the subsequent memoranda relating thereto: that "in addition to future business all existing loan agreements and options which involve the issue for subscription by the public of loans be pooled with the exception of agreements and options relating to industrial undertakings (including railways) upon which substantial progress has been made"; further, "that all groups will surrender to the consortium any such agreements and options which they themselves possess or control"; and "that the group will use their best endeavors to induce other members who may possess or control any such agreements or options to surrender the same to the consortium." It was also resolved that favorable consideration should be given to the applications of Russian and Belgian groups for membership in the consortium. By the agreement initialed at this conference the groups reserved to each the right of increasing or reducing the number of its own members, and it was agreed that no group should be entitled to admit into its group a new member "who is not of its nationality and domiciled in its market" except with the consent of the other groups. It was agreed that the bankers' undertaking should relate to existing and future "loan agreements which involve the issue for subscription by the public of loans to the Chinese Government or to Chinese departments or to Provinces in China or companies having Chinese Government or Chinese Provincial guaranties"; but that existing agreements relating to industrial undertakings upon which it could be shown that substantial progress has been made might be omitted

from the scope of the agreement. It was stated in the preamble of the agreement, among other things, that the British, French, Japanese, and American groups, having been formed for the object of negotiating and carrying out of Chinese loan business "are entitled to the exclusive diplomatic support of their respective governments." It is especially to be noted that this agreement, including as it did industrial loans, differed from the interbank agreement of 1912, which covered administrative loans only.

On May 31 this Government communicated copies of the resolutions and agreement adopted by the bankers' conference to the British, French, and Japanese Governments, through their representative at Washington, informing those Governments that it accepted and confirmed the said resolutions, and expressing the hope that those Governments would promptly give like confirmation in order that the formal organization of the new consortium might be completed prior to the expiration of the old consortium agreement on June 18, 1919. This Government was informed on June 6 that the French Government, having assented in advance to the general lines of the plan for the consortium which had been submitted by this Government, and the groups in their resolutions having taken those principles as a basis for their resolutions and agreements, the approval of the French Government might already be considered as given. The French Government pointed out, however, that it believed it necessary to define its attitude with regard to one point, namely, the amount of support to be given to the consortium by the French diplomatic representatives in China. It called attention to the fact that in France as well as in England the banking groups, while admitting new parties, had left out certain establishments having important interests in China; and it observed that new enterprises might be created at any time which, while desirous of acting in China, might not be disposed to enter the consortium, or which the consortium might not be desirous of admitting. The French Government noted further that there was nothing in its legislation that permitted it to limit the individual activity of private persons or of financial and industrial corporations; and stated that inasmuch as the consortium had not and was not able to group all of the French elements which were working or might one day desire to work within the territory of the Republic of China, it could not lay claim to the exclusive support of the French Government. The French Government, therefore, proposed the following formula concerning the support to be given the consortium:

> The Governments of the four participating groups undertake to give their complete support to the consortium in all operations which it will undertake and which will have for their object the improvement of the financial

situation of China and its industrial development. In case of competition for the obtaining of any specific contract, the collective support of the diplomatic representative in Peking of the four Governments will be exclusively assured to the consortium.

On 7 June this Government was informed that the British Government had notified the Hongkong and Shanghai Bank that the minutes of the two meetings held in Paris, and of the draft intergroup agreement, met with their approval except as regards the statement in the preamble thereof, which assured to the groups of the consortium the exclusive support of their respective Governments. The British Government stated that it was unable to afford this exclusive support by reason of the fact that the British group did not include all British interests involved in enterprises in China.

It will thus be seen that the British and French Governments found themselves in a similar position as regards the question of the degree of diplomatic support which should be given to their respective members of the consortium. On 1 July this Government suggested as an alternative to the French formula the following, which it hoped would meet the objections of the French and British foreign offices, as an interpretation of the bankers' agreement of 12 May:

The Governments of each of the four participating groups undertake to give their complete support to their respective national group members of the consortium in all options undertaken pursuant to the resolutions and agreement of the 11th and 12th of May, 1919, respectively, entered into by the bankers at Paris. In the event of competition in the obtaining of any specific loan contract the collective support of the diplomatic representatives in Peking of the four Governments will be assured to the consortium for the purpose of obtaining such contract.

The principal change involved was the pledging of each Government to the support of its respective national group rather than to the consortium collectively, for it was believed that this proposed change made the formula more in accord with the actual facts and with the established practice of this Government. The French Government accepted the American formula on 17 July, the British Government on 16 July, and the Japanese Government signified its acceptance on 8 October, 1919.

Attitude of Japanese Bankers and Government Toward Consortium.

The representative of the Japanese bankers, Mr. Odagiri, who met with the bankers' representatives in Paris, signed on behalf of the Japanese bankers the interbank agreement which was drawn up at that conference; but up to the middle of June this Government received no definite word as to the attitude of the Japanese Government upon those resolutions and agreement, although it was un-

officially reported that such approval would be conditional upon the exclusion of concessions in certain localities where the Japanese claimed special rights.

On 18 June, however, this Government was informed that Mr. Odagiri had written a letter to Mr. Lamont, the representative of the American group, setting forth the attitude of Japan toward the consortium. Mr. Odagiri stated that Japan's approval of the proposed new consortium was subject to the condition that all rights and options held by Japan in the regions of Manchuria and Mongolia, where Japan has special interests, should be excluded from the arrangement for pooling provided for in the proposed agreement. Mr. Odagiri stated that Japan's position was based upon the very special relations which Japan enjoyed geographically and historically in the regions referred to, and which, he stated, had been recognized by Great Britain, the United States, France, and Russia on many occasions. He drew Mr. Lamont's attention to the so-called Lansing-Ishii exchange of notes of 2 November 1917, and pointed out that the Japanese group at the time of signature of the Chinese reorganization loan agreement of the 18th of June, 1912, had made a reservation to this effect. The Japanese bankers, in presenting these views to Mr. Lamont stated that they personally disagreed with these views of their Government but were obliged to present them for consideration. They stated that they had urged very strongly upon their own Government their views on the matter.

The American bankers pointed out to the Japanese delegates that such a position, if persisted in, would mean practically the annulment of the whole plan. The attitude of the Japanese bankers was duly communicated to the British and French Governments, both of which agreed that the exclusion of Manchuria and Mongolia from the scope of the consortium was totally inadmissible. In a memorandum presented on July 30, 1919, to the Japanese chargé d'affaires at Washington, special reference was made to the position of the Japanese Government in regard to the consortium, as represented by the Japanese bankers to Mr. Lamont, and this Government stated its attitude toward the Japanese position as outlined. The text of this memorandum was communicated to the British and French Governments with the request that they should make similar representations to the Japanese Government. In that memorandum this Government stated its fear that the Japanese Government was acting under a misapprehension as to the object and purpose of the consortium, which it understood did not contemplate the elimination of private enterprises or of the activities of financial or industrial corporations. This Government informed the Japanese Government that it could not consistently consent that the American bankers should agree to the proposed reservation

" for the reason that it is believed to be an essential prerequisite to the proper functioning of the consortium that all Chinese business of the classes proposed as appropriate for the activity of the consortium be available for it;" and the hope was expressed that the Imperial Japanese Government would share the views of the American Government in this regard.

On August 11 the British Government presented a memorandum to the Japanese Ambassador urging the withdrawal of the claim of the Japanese group for the exclusion of Manchuria and Mongolia from the scope of the consortium.

On August 23 the French Government likewise addressed a memorandum to the Japanese Government, expressing the hope that it would instruct its financial delegates to relinquish their request for the exclusion of Manchuria and Mongolia from the scope of the consortium.

On 27 August, the Japanese chargé d'affaires at Washington handed to the department a note to the effect that his Government accepted and confirmed the resolutions adopted at the meeting of the representatives of the banking groups of the United States, Great Britain, France, and Japan at Paris on 11 May and 12 May, 1919, for the purpose of organizing an international consortium for financial assistance in China; provided, however, that " the acceptance or confirmation of said resolutions shall not be held or construed to operate to the prejudice of the special right and interests possessed by Japan in South Manchuria and Eastern Inner Mongolia." When the chargé d'affaires presented this note, he made an oral statement explaining the Japanese Government's interpretation of the special interests which it claims in the regions named. His statement was substantially to the effect that not only were interests of national defense and of the economic existence of the Japanese people deeply concerned, but that " the special position held by Japan in these regions is the natural fruition of the sacrifices both in blood and treasure which she was called upon to pay in self-defense, and is, therefore, entirely different in character and origin from any position that other powers might possess in any locality of China." He stated that the feeling of the Japanese people was very sensitive vis-a-vis any question affecting their interest in those regions, and that there existed a widespread uneasiness among them as to the functioning in the future of the proposed consortium, it being feared in some quarters that the possible development of the new international financial scheme might prove fundamentally destructive to the position which Japan enjoys in South Manchuria and Eastern Inner Mongolia. He urged that it was quite evident how difficult it would be for the Japanese Government, in the face of the strongest dis-

approval of the general public in Japan, to submit to an arrangement of the kind proposed, which would necessitate the pooling for common activity of an international financial group of such enterprises as might affect the special rights and interests of Japan in those regions. From information received it appears that the Japanese Government notified the British and French Government of its adhesion to the consortium made to this Government as outlined above. To the French Government they appear to have stated simply their adhesion to the consortium on condition that South Manchuria and Eastern Inner Mongolia might be excluded from its scope, and no accompanying statement defining the nature of the special interests involved, such as was made to this Government, appears to have been made. To the British Government the Japanese Government apparently made a statement to the effect that their reservation, in so far as it applied to Southern Manchuria and Eastern Inner Mongolia, excluded only certain interests which they intimated their intention to set forth in a schedule to be supplied to the British Government.

Attitude of American Government Toward Japanese Reservations of 27 August.

From the beginning it had been the view of this Government that it was not the purpose of the consortium to interfere with vested interests of a specific nature. The wording of resolution No. 2, adopted by the bankers' conference at Paris, is very clear in that regard. It seems important that the actual wording of that resolution should be repeated, for it is believed that it forms an adequate answer to any fears which may be entertained by the holders or owners of interests in China which have been developed to such a point that they could be termed vested interests. That resolution reads:

> (2) It was resolved: (*a*) That in addition to future business all existing loan agreements and options which involve the issue for subscription by the public of loans be pooled, with the exception of agreements and options relating to industrial undertakings (including railways) upon which substantial progress has been made; (*b*) that the groups will surrender to the consortium any such agreements and options which they themselves possess or control; (*c*) that the groups will use their best endeavors to induce other parties who may possess or control any such agreements or options to surrender the same to the consortium.

In the memorandum addressed to the Japanese Government of July 30, through its Embassy at Washington, this Government had pointed out that it believed that the purposes and objects of the consortium did not contemplate the elimination of private enterprises or the activities of financial and industrial groups, nor was it the desire of this Government that they should do so.

While the statement made to this Government by the Japanese Government in connection with its adherence to the consortium was of a general nature, as regards its reservation of Southern Manchuria and Eastern Inner Mongolia, its statement made at the same time to the British Government appeared to be so moderate in its nature as to have led the British foreign office to conclude that the Japanese Government was ready to set forth in a schedule the specific vested interests held by Japan or by Japanese nationals in the regions named; and it was apparently the feeling of the British foreign office that this might prove an acceptable solution of the difficulty. It was, therefore, in the expectation of such a solution that this Government awaited with interest the submission to the British Government of a schedule of interests claimed by the Japanese Government in the regions mentioned. On October 2, however, this Government was informed by its ambassador at London that the Japanese ambassador had communicated to the British foreign office not a schedule of specific interests but a territorial definition of reservations. It is understood that the reservations as defined by the Japanese ambassador were essentially that the scope of the consortium should be limited so as to exclude South Manchuria, comprising territory whose northern point "is the line drawn through the point which the railroad line from Changchun crosses the lesser Sungari River and east and west paralleling the main Siberian railroad"; and Eastern Mongolia defined somewhat vaguely as territory "comprising the greater portion of the four tribal leagues nearest to Manchuria, which leagues are allied to constitute a quasi independent district of their own." It appeared to be the view of the British foreign office that the situation presented three possible alternatives: "(1) The exclusion of Japan from the consortium; (2) continued pressure to induce her to withdraw all reservations"; and (3) an alternative which contemplated a modification of the reservations made by Japan. It was the view of the British foreign office that the first and second alternatives were out of the question, first because of the undesirability of excluding Japan from the consortium completely, and secondly, because of the necessity of immediate action in view of the financial needs of the Chinese Government. It was, therefore, the desire of the British foreign office that this Government express its opinion as regards the following interpretation and application of the third alternative, namely, that the reservation regarding South Manchuria, as above outlined, be accepted on account of its propinquity to Korea, its clear definition and the existence of recognized railroad and other concessions therein. It was confidentially intimated in this connection that the Lansing-Ishii agreement might be invoked by Japan in support of

its contentions. It was the opinion of the British foreign office that the reservations regarding Eastern Inner Mongolia should not be accepted owing to its indefinite character and to the absence of such special conditions as those which existed in South Manchuria—but that South Manchuria being really the crux of Japan's desire, in this matter the reservation covering Eastern Inner Mongolia would be dropped.

Summary of Negotiations.

The situation thus presented after a year's negotiations may be summarized as follows:

(1) The proposals for the organization of the new consortium made to the British, French, and Japanese Governments in July and October, 1918, were accepted in principle by those Governments as to the working basis upon which to found a new international combination of bankers for supplying funds to the Chinese Government.

(2) Those proposals were accepted and confirmed by the representatives of the American, British, French, and Japanese bankers at the Paris conference of 10 to 12 May, 1919.

(3) The question of the degree of diplomatic support to be afforded to the consortium by the Governments involved was quickly settled by the acceptance by France and Great Britain, and eventually by Japan, of the formula proposed by this Government.

(4) The year of negotiations just passed has been characterized on the part of the British and French Governments, and of the Japanese bankers, by a liberal and self-denying spirit, all being apparently interested in eliminating as far as possible disturbing and complicating political motives from the discussions which it was felt should be based primarily upon sound business principles and motives.

(5) The Japanese Government during this year of negotiation has been disappointingly reluctant to cooperate. When the proposals were first made, it failed to communicate them to its bankers; it later neglected to invite them to organize a group for participation in a consortium until some eight months had passed; and, finally, it delayed notifying the other interested Governments of its attitude toward the whole plan of the consortium until almost a year had passed.

(6) At the end of that year the Japanese Government has come forward with a proposal which introduces questions which are entirely new, foreign to the purpose for which the consortium was intended, and contrary to the liberal and self-denying spirit which has characterized the whole negotiations up to this time.

Questions Now at Issue.

The success of the whole project of the consortium would thus be made dependent upon the willingness of the several interested Governments to reopen this whole question with a view to granting to the Japanese Government special preferential and exclusive rights, tantamount to the recognition of a doctrine of spheres of interest more advanced and far-reaching than has ever before been conceded to China.

A telegraphic expression of this Government's attitude concerning the Japanese reservations was sent on 11 October, in response to an inquiry from the British Government through the American Embassy at London on 2 October. This Government can not admit the claims now advanced by the Japanese Government with respect to either South Manchuria or Eastern Inner Mongolia, and considers that if the position of Japan tends further to delay the organization of the consortium, it will be necessary for the other interested nations to take independent action for the resolution of the unfortunate and potentially dangerous situation which has come to exist in China.

ACTIVITIES OF THE MEXICAN GOVERNMENT IN SPAIN.

Source: Reliable.

A glance at extracts from letters written by the Mexican minister of foreign affairs to the Mexican minister at Madrid will be of interest. These letters were written under dates of June 20, 1919, to September 6, 1919, and were addressed to Senor Don Eliseo Arredondo.

Letter dated June 20, 1919:

> Whether or not the Americans will intervene in our country I do not know. There are many reasons that would lead one to believe that they will eventually do so. Their desire to intervene is unquestionable.
>
> If it (intervention) should occur, Mexico will be unable to obtain war supplies except in Spain. You of course know that unfortunately military industries do not exist in our country and that they cannot be built up overnight.
>
> We have succeeded after long and tedious negotiations in persuading Spain to deliver to us the rifles which she before the war had obligated herself to manufacture for us. This will serve as an argument for our request that the Spanish Government furnish to us the corresponding cartridges for the rifles already mentioned, which are very satisfactory, and in addition gunpowder manufactured in Spanish military works (incomplete).
>
> (Signed) AGUILAR.

Letter dated June 25, 1919:

> I urge upon you a complete study of the manufacture of guns, cartridges, and gunpowder in Spain. Though we know that these industries are well established in Spain we are ignorant as to their details. We know that she has gun factories in Trubia and Sevilla, factories for rifles and machine guns in

Ovideo, but again I emphasize the fact that it is necessary to know these details that we may have data before making our request for 500 machine guns and 10,000,000 cartridges for the rifles already mentioned.

It is also necessary that you inform yourself of the importance and operations of the centers at which torpedoes are prepared for the Spanish military marine.

(Signed) AGUILAR.

Letter dated July 7, 1919:

In view of the internal and foreign difficulties which the United States are now undergoing, Wilson's policy is causing indignation amongst the parties, and the press is vehemently attacking the President. He goes from one blunder to another, and shows more clearly each day that he is incompetent.

If the failure in Europe was not enough it should be apparent by the impertinent notes that we have received from Washington and which President Carranza has answered with the insolence that those Yankees merit.

I see in all this an uncalled for desire to intervene in our country. Time will show me to be right.

You ask me concerning the coming elections. The country is preparing for the contest. The candidates, Gens. Obregon and Diaz, have their adherents, and it is difficult to foretell what actually will happen. Carranza is firm in his declaration of returning to private life, and because of this wishes to be absolutely impartial in the coming elections.

Our mutual friend, Gen. Trevino, will inform you verbally upon some other matters.

(Signed) AGUILAR.

Letter dated July 14, 1919:

In virtue of the distinguished Gen. J. B. Trevino having been appointed minister of the Republic to Belgium the Government has intrusted to him a mission in Spain and France and we know that your excellency will do all in your power to assist him.

If your excellency considers that the presence of Gen. Mondragon would be helpful please telegraph Gen. Mondragon so that he may be posted as to your interview with the minister of war.

If your excellency does not desire his presence, please send him attached letter retaining a copy for the legation.

(Signed L. BERNADEZ.

Letter dated July 20, 1919:

I entered upon the duties of minister of foreign affairs, as Aguilar is going to France in regards to the suitability of Mexico joining the league of nations.

You will be unable to imagine the amount of work with which I am burdened. As if our internal troubles were not enough, the English minister delivered some notes that may cause strained relations. If this should occur the probability is the American legation will take charge of British interests which will cause embarrassment for our Government.

There is a great deal of commercial activity and prospects for a great manufacturing movement due to the initiative of rich Germans to whom the Government intends to lend its support.

Aguilar will advise you concerning the present status of the treaty with Japan.

(Signed) L. BERNADEZ.

Letter dated August 23, 1919:

I am very much pleased that you have secured the quantity of powder mentioned in your letter and which you say will be shipped as soon as possible.

Unfortunately relations with the United States are not very cordial, and the statement by the Department of State that it will be necessary to intervene in Mexican affairs demonstrates clearly the intentions of certain Yankee elements.

From the letters of our representative in Washington, we gather that the desire for intervention in our country has for its objective the control, by a few ambitious men, of certain of our resources such as our oil fields and mineral deposits and who would not hesitate to infringe upon our rights to obtain this control.

We read in the newspapers that arrive here from North America that they (ambitious men referred to above) are endeavoring to influence Wilson. For instance, the New York Sun states "The United States must follow the same course in regard to Mexican affairs as in Cuba." Thus it is seen that it is their desire to place us before the world as a nation unable to govern itself. They do not realize that they will not catch us unprepared and that they will pay dearly for their bold venture.

(Signed) L. BERNADEZ.

Letter dated August 25, 1919:

Carranza received correspondence from Mondragon and the latter appears very optimistic concerning his interviews with the personages he visited in Paris. However, the statements of the Americans are at variance with the opinions of Gen. Mondragon. It is impossible for the United States to prevent the contraband in arms for the insurrectionists, and though many cases are held up in New York the Government has paid no attention to our

demands, the Department of State itself declares that intervention in Mexico is necessary to straighten out our affairs.

From Aguilar's correspondence we see the correctness of seeking the moral support of our sisters, the Latin Republics, and we are sure that Argentina, Chile, Peru, and the other Republics can not remain neutral in face of the danger that threatens them.

(Signed) L. BERNADEZ.

Letter dated August 27, 1919:

The staff report on the powder received is being sent you under separate cover.

The cartridges have arrived in perfect condition and we are impatiently awaiting the arrival of the machine gun that we may test it. As soon as the results of the test are known, the minister of war informs me that an order will be placed by telegraph in order to gain time.

And with all this occurring I regret with all my soul that the situation is daily becoming more acute, a situation brought about by a few ambitious Yankees.

(Signed) L. BERNADEZ.

Letter dated September 3, 1919:

Mondragon's recent letters dated Paris and his interviews with the French leaders would seem to indicate that our international position will remain status in quo, but will this be for an indefinite period of time?

In their opinion there is no fear of complications at present, but there should be no excuse for us to be caught napping while the European situation is being arranged.

(Signed) L. BERNADEZ.

Letter dated 5 September, 1919:

Confirming my last letter, I dwell again upon this matter and inform you that the order for 10,000,000 cartridges which the ministry of war is issuing must be of the same kind and quality as the last shipment, and you must endeavor to have them sent with the greatest possible promptness.

I will approve the bank account in one of my letters.

(Signed) L. BERNADEZ.

Letter dated 6 September, 1919:

Apparently the military industries of Spain are far ahead of the best organized of other countries. The machine gun is perfectly satisfactory and impossible of improvement.

It is necessary to obtain all available information that the greatest number possible may be obtained. Please sound the

ministry of war with the object of ascertaining how large an order could be filled.

Do the same in regard to the powders, especially the smokeless, which is also perfectly satisfactory powder for the rifles. We do not wish to place a larger order than can be filled.

(Signed) L. BERNADEZ.

Under date of 9 December, 1919, of 26 November, 1919, and 9 December, 1919, copies of the following telegrams were received:

MADRID,

(*Dated 9 Dec., 1919. Recd 10 Dec., 1919, 9.01 a. m.*)

Letters from Mexico, signed H. Medina, dated 3 and 5 November, arrived 7, 8, and 10 November. Col. Osuna is said to be charge of the purchase of munitions in Spain. Intervention believed certain; Japanese sympathy is counted on and an attempt being made to obtain Japanese assistance. Munitions only to be bought in Spain. From Spanish interests in Mexico loan of 750,000,000 pesetas to be raised. One hundred machine guns are contracted for, and more are wanted. Attempt made to obtain Winchester carbines formerly used by the Guardia Civil. Texas, California, etc., referred to as the Alsace-Lorraine of Mexico. Revolution again started in Mexico. There is a report which is not confirmed, that the Germans are sending officers and men and noncommissioned officers to Mexico.

(MADRID, *26 November 1919.*

Rec'd *28 November 1919—9.09 a. m.*)

Request that this information be transmitted to the State Department and to the Navy Department.

Letters from Mexico dated 16, 18, 20, 25, 26, and 28 October have been obtained. They are signed by H. Medina and are addressed to Arredondo. Aguilar is directed to visit the Hispana-Suiza factory in Barcelona; American aeroplane base in Lower California is referred to, and difference(s) *since this* with Great Britain; probable intervention by the United States as indicated by the prohibition of the traffic in arms referred to. State that every effort to foment trouble for the United States is being made. State that Japan and Spain are Mexico's only friends. Refer to Japanese immigration and diplomatic propaganda in Spain, and to the stimulation of Spanish emigration to Mexico. Direct that inquiries concerning Mexican loan be made.

After reading the foregoing extracts a summary of the report of the naval attaché at Madrid will be of interest under date of October 8, 17, and 21 and November 5, 1919.

During the presidency of Portfirio Diaz the Mexican Government negotiated with Spain for a delivery of some 20,000 Mauser rifles, similar to the Spanish model with the exception of a slight modification made by Gen. Mondragon.

These negotiations were interrupted by that series of events resulting in the downfall of Portfirio Diaz, the coming into power of Francisco Madero, his assassination, followed by the accession of Huerta to the presidency.

The Spanish Government was in a quandary as to whom the rifles should be delivered, a part payment having apparently been made by the Madero Government.

It would seem that Madero, Huerta, and Carranza made unsuccessful attempts to obtain possession of these rifles.

As Spain at first did not recognize the Carranza Government the endeavor to acquire them was a difficult one. Upon the renewal of relations between these two countries Don Juan Sanchez Azcona was appointed Mexican minister to Spain, being followed a short time later by Don Eliseo Arredondo. Both of these men tried to obtain these rifles for the Mexican Government, but because of wartime prohibitions imposed by the allies were unable to do so.

Upon the termination of the war the Mexican Government again began negotiating with those countries with whom she had had prewar contracts for war supplies.

Several prominent Mexicans have journeyed to Spain with hopes of concluding successful contracts. Among these may be mentioned Gen. Trevino. Press notices in April stated that Gen. Trevino was to visit Europe for the purpose of studying the organization and equipment of European armies and to formulate a plan for the reorganization of the Mexican Army. It is reported that Gen. Trevino had an audience with the King on September 23 concerning the supply to Mexico of munitions by Spain and also the rifles previously mentioned. It is also reported that he had interviews with the minister of war and several ordnance officers of the Spanish Army. His endeavors, however, were not successful and it is reported that he has now gone to Germany with hopes of closing contracts for war supplies in that country.

The commission controlling American war supplies in France was approached in regard to the purchase of munitions for Mexico, as was also the firm of Urquijo, an important Spanish munition company. The latter, however, refused to enter into any such transaction.

About the middle of July information was received that Gen. Antonio Aguilera was in San Sebastian and that he had interviewed

Gen. Mondragon, a Mexican Army officer residing permanently in that place. Mondragon is a Felicista and has apparently been reporting to the Carranza organization, but later information says that he is backing Palavicini for President of Mexico in opposition to the Carranza candidate.

An unconfirmed report has it that Aguilera's real mission was to block through an envoy of the Pope a loan of $10,000,000 to Felix Diaz, reported as being raised in the United States under the direction of Cardinal Gibbons.

Candido Aguilar arrived in Madrid on August 5, 1919. His ostensible mission was to represent Mexico at the peace conference, but it is reported that his real mission was to procure munitions for Mexico from Spain. He had conferences with several officials, as did Trevino.

A Mexican commission of three civilian members viz: Antonio Mediz Bolio, Enrique Aragon, and Manuel Caballero arrived in Spain during the early part of October. Their mission is to foster a rapprochement between Mexico and Spain by means of the newspapers and public meetings.

It would seem from information at hand that the Mexican Government is attempting to acquire the following war supplies from Spain:

Powder, any amount.
Disks for cartridges, any amount.
Five hundred machine guns.
Bomb-dropping apparatus and machine guns for aeroplanes.

It is reported that in June, 1919, a Mexican colonel arrived at Ovideo from Madrid, his object being to purchase rifles for the Mexican Government, but it is thought that no rifles for Mexico have been made or sold during the last three years.

It is said that pistols are sold in Mexico by the crews of ships going to that country. These pistols are purchased in stores throughout Spain.

A report from the small-arms factories, however, shows no increased activity. The quantity of munitions being turned out is not in excess of that required by the Spanish Government and it is not believed that the Mexican Government has as yet succeeded in buying any great quantity of war supplies. The Mexican legation at Madrid, however, is showing signs of great activity.

It is evident that the purpose of the Mexican Government is to foster cordial relations between Mexico and Spain and incidentally other American countries; to create in Spain ill feeling and distrust toward the United States; to borrow money in Spain.

It is not believed that the endeavors of the Mexican Government have to date met with any great degree of success.

MEXICO—INTERNAL CONDITIONS.

Source: Reliable.

13 December 1919.

The newspapers of Mexico City have reported that both Villa and Felix Diaz have sent a circular to all members of the old Federal Army urging them to join the rebel cause and avenge the death of Gens. Auerliano Blanquet and Felipe Angeles. It is also reported that Villa is making strenuous efforts to join forces with the Yaqui Indians and that he will also endeavor to increase depredations on the railroads.

The American consul at Piedras Negras has reported that force of 300 Villistas took Musquiz, State of Coahuila, on the night of 9 December. It is reported that the town of Musquiz was completely looted of provisions and several civil officials were killed by Villa.

Press reports indicate that an American citizen by the name of Fred G. Hugo, the manager of J. M. Dobies's ranch, near Musquiz, Coahuila, is being held for $10,000 ransom by the rebels. This was later confirmed by consular reports. These reports state that Villa did not molest the poorer inhabitants of the town, but confined his loot to the wealthier residents and the principal stores.

It is believed that this blow to the Carranzistas is in line with the purpose of Villa to avenge the death of Gen. Angeles, for it is asserted that a large number of his men, who are well equipped and well mounted, have been dispatched to southern Coahuila to operate in the vicinity of Cuatro Cienages, where President Carranza's large estates are located.

Later reports indicate that Musquiz was completely ransacked and the loot removed to the mountains by the Villistas, who are reported to number about 1,000.

The American consul at Guaymas, Sonora, has reported that a large band of Yaqui Indians practically annihilated a body of 200 Federal troops at Onavas, Sonora, on 25 November.

Cases of smallpox and typhoid fever are reported to be increasing rapidly in Mexico City, due to the filthy conditions of the streets. Epidemics of malaria are also reported to be causing havoc in various parts of the Republic.

Economic.

According to the press of the Mexican capital, the French railways have placed an order with the Mexican petroleum companies for 7,500,000 barrels of crude petroleum to be used for fuel on the French lines. This is the second largest order that has ever been placed for oil in Mexico.

Mr. Luis Cabrera, minister of Hacienda, has denied, through the press, the insistent rumors that the Mexican Government will soon issue paper money to replace the silver money which has gone out

of circulation as a result of the high price of silver bullion in foreign markets.

Gen. Adolfo de la Huerta, governor of the State of Sonora, is apparently endeavoring to meet the Government debts promptly, and as a consequence conditions are said to be much improved in that respect.

The Mexican press reports that the Mexican Federal Government, through the Department of Fomento, will aid the cattle men of Durango in replacing stocks of cattle in that State. It is estimated that the loss of cattle in that State has amounted to over 50,000,000 pesos since the beginning of the revolution.

The Mexican press of 17 November reports the arrival in Vera Cruz of the German steamer *Hans*, the first German ship to arrive in Mexico since the beginning of the European War. The *Hans* carried a valuable cargo of drugs and dyestuffs, and her captain declared that numerous vessels are being constructed in Germany for commerce with other nations of the world, and especially with Latin America.

The Mexican Government is reported to have granted a concession to a Japanese concern known as the Matsumato Trading Co. of Japan, for the exploitation of all oil land on either side of the Tamesi River in the State of Vera Cruz. Two representatives of this company have been in the region for some time inspecting the territory of Tampico and Tuxpam. They were also provided with safe conducts to go into the Pelez district, with a view to purchasing some oil wells controlled by a Spanish company there. It is further reported that the Japanese concern is to finance the construction of a railroad between Tampico and Tuxpam.

Japanese interests are said to be planning to lay a cable from Salina Cruz, Oaxaca, to South American ports.

GREAT BRITAIN.—POLITICAL AND SOCIAL NOTES.

Source: Reliable. **29 November 1919.**

It has been announced in the House of Commons that a plan is under discussion by the British and American Governments under which the payment of interest on advances by Great Britain and the United States to the Allies in the course of the war, and also on advances by the United States to Great Britain, would be postponed for three years—"until the war reaction passes."

James O'Grady, member of Parliament, has left for Copenhagen to negotiate with M. Litvinoff, representing the Russian soviet government, for the exchange of prisoners, military and civil.

A movement appears to be under way in British circles to invite Germany to enter the League of Nations immediately as an offset

to the failure of the United States to give its adhesion to the covenant. Some of the foremost British advocates of the league are in favor of such a course.

Mr. Lloyd-George has informed a deputation of the cabinet's decision that there is no longer any political objection to the construction of a channel tunnel.

No domestic event has so stirred the press for many months as the reduction of 10 shillings a ton in the price of coal for household use. A deep political move is thought in some quarters to be at the bottom of the matter, one suggestion being that as several by-elections are impending, the concession to householders is a vote-catching dodge. While the coal owners assert the reduction in price means ruin for them, as coal can not be produced under such conditions except at a grave loss, the miners' leaders contend that the reduction can and ought to be carried much further. The secretary of the Miners' Federation says that the coal used by domestic consumers amounts to only 15 per cent of the total and that its reduction by 10 shillings absolves only £11,000,000 of the surplus money obtained through the July increase, there being still £40,000,000 at the Government's disposal for a further reduction. The Laborite members of the House of Commons intend to carry on an agitation against the Government until this alleged surplus has been applied to lowering the price all around, especially on industrial coal.

Explaining the Government's decision, Sir Auckland Geddes stated that the prices for export coal were unprecedentedly high and the decrease in prices had been postponed because of events in the United States. The prices of coastwise and bunker coal were high also, and it was from these sources that profits were being made. The coal used for inland purposes was being sold at less than the average cost of production. He stated that this was an unsatisfactory position, and that industrial coal must be sold on an economic basis at the earliest possible date. The Government proposes gradually to transform the coal control machinery until it consists of three parts—the limitation of exports, the limitation of owners' profits, and special limitation on the price of coal supplied for domestic purposes. The price of coastwise coal has been reduced also by 30 shillings.

GREAT BRITAIN—MISCELLANEOUS NOTES.

Lord Jellicoe and Imperial Defense.

Admiral Lord Jellicoe's report on naval affairs emphasizes the desirability of Australia's becoming self-contained in regard to the

manufacture of guns, mountings, explosives, and other munitions, and also of aircraft.

The naval interests of the Empire, the report says, are likely to demand within the next five years a strong Far Eastern Fleet, comprising vessels of the Royal Navy, the East Indian Squadron, and the Australian, Canadian, and New Zealand navies, and it suggests that each Dominion, as well as India and Great Britain, should bear the cost of vessels specially allocated for their own harbor defense. The annual cost of maintenance of the Far Eastern Fleet is estimated at £19,750,000. The report has been tabled in the House of Representatives.

Australia's share of the cost of the Far Eastern Fleet, as proposed in Lord Jellicoe's report, would be £4,000,000 yearly, rising to over £6,000,000 in 1927. The fleet is to include at least 8 modern battleships, 8 modern battle cruisers, 10 light cruisers, 40 destroyers, and 36 submarines.

Political.

On 25 November Lord Curzon, secretary of state for foreign affairs, made a speech in the House of Lords in regard to affairs in Egypt. His main point was that Egypt had not been annexed in 1914 but had become a British protectorate. He said that from the time of Lord Dufferin's mission, 40 years ago, to the organization of 1913 and to the mission of Lord Milner, British policy in Egypt was one of progressive development of self-governing institutions. That Egypt could not stand alone and must cease once and for all to look to Turkey and must fix her hopes on the power that had done so much for her welfare in the past.

Economic.

The miners have commenced their campaign for the nationalization of the coal mines with the education of their own workers and the necessity of carrying out the plan. The rank and file, however, do not appear to be evincing very much enthusiasm.

Sir Auckland Geddes announced recently that a contract for potash to the value of £750,000 has been entered into with the German Government.

It is reported from Swansea that a new Japanese steamship service has been established between Swansea and eastern ports by the Nipon Yusen Kaisha. One of these Japanese boats is expected in Swansea every three weeks and they will carry important cargoes of tin plates, black plates, and galvanized sheets.

It is stated that the result of putting into effect the seven-hour day in the coal mines on 16 July, is now estimated to result in a deficiency of 6½ per cent production instead of 10 per cent as estimated

by the Sankey Commission. The miners are now demanding either removal of 6 per cent advance in the selling price of coal which was based on the estimate of 10 per cent reduction in output or a further wage increase.

Sir Hamar Greenwood, parliamentary secretary of the department of overseas trade is reported to be fostering a plan for permitting commercial travelers representing British business firms to be transported on British warships to all parts of the world in view of the great number of business men who are being held up on account of lack of transportation facilities.

Financial.

The Government's revised estimates for the year ending 31 March next, placed the financial deficit at £473,000,000, which is £223,000,000 more than Mr. Chamberlain estimated in his budget of April last. The national debt is now given as £8,075,000,000. The amount repayable on redemption of national war bonds during the next 10 years exceeds £1,562,000,000.

GERMANY—POLITICAL AND SOCIAL.

Source: Reliable.

29 November 1919.

Close attention is being paid in Germany to the situation in the United States with regard to ratification of the peace treaty. On the whole the Germans assume the rejection by the United States Senate to be to their advantage, but there is also no doubt that they are taking the attitude of the United States as one form of propaganda to induce discord among the Allies. It is believed in some quarters that German unwillingness to sign the protocol, which would have made it possible to proclaim peace on the 1st of December, was encouraged by the failure of the United States to act.

That this situation may have stiffened German resistance is, of course, possible, but the reasons given for resistance seem sufficient without the additional reason of American delay in ratification. The Germans state that they can not accept the allied insistence on Government responsibility for the sinking of the fleet at Scapa Flow. They consider also the Allies' contention that the terms of the armistice have not been carried out to be in some particulars neither understandable nor true. They state that the delay which they consider unjustifiable in returning German prisoners to Germany makes them distrust the word of the Allies in other matters; also that they can not consent to give up the Kaiser and others responsible for the war. It is believed by some, in fact, that this is

the main reason for refusal to sign the protocol, that the German Government realizes the surrender of these men would immediately bring about a crisis and would give the reactionary forces an opportunity to attack the Government with hope of success.

The German press, in commenting on America's failure to ratify, express rather widely the belief that the situation is of no assistance to Germany except that direct negotiations with the United States may facilitate the settlement of certain economic questions. Some papers take the ground that the Senate's failure to ratify is a death blow to the League of Nations and that this simply means the collapse of an artificial structure, and further more that in its place time will soon mature a genuine socialistic league of nations. Herr Schüking, a German pacifist and member of the German peace delegation, says that the rejection of the treaty is a "tremendous moral victory for the cause of universal peace," adding that the delay in ratification will give Americans further opportunity to study the document which he hopes sincerely they will do. Vorwaerts says that the treaty in its present form can not go into effect if the American rejection of the document is final, since American accession is indispensable to its enforcement. "Germany," says Vorwaerts, "will be justified in refusing to recognize any interallied commissions without American representatives and has a right to protect herself against any disadvantages which may result from America's withdrawal." There is, except in the Government organs, a note of jubilation in that they claim the American attitude proves the treaty of Versailles to be, at least, not unalterable.

The Tages Zeitung, in commenting on America's action, says that America above all countries can not afford to be indifferent to Germany's economic future and warns that delay in bringing about a formal state of peace will give England and France the opportunity to "buy up Germany" to prevent America from using it as a country of transit and storehouses for her future Russian trade.

All the papers agree that the Senate's action on the treaty is not prompted by any sentiment in favor of Germany, and add that the United States undoubtedly will not grant any credits to Germany except such as will further her trade interests in disposing of raw materials.

A bill has been introduced in the German National Assembly for the creation of workers' councils. This is the first step taken in carrying out the provisions in the German constitution with regard to the protection by the workmen themselves of their interests in the establishments where they are employed. This bill provides that such councils shall be formed in all trades which employ at least 20 workmen, the duty of the councils being to look after the interests of the workmen in regard to wages, working conditions, hours,

contracts, arbitration, health, and accident insurance, etc. It is not specified exactly as to whether these councils are to have more than advisory powers.

So far as the food situation is concerned, the outlook appears dark, considering the very low value of the mark, and also noting that the German agriculturalist committee has published an article stating that German agriculture can no longer supply people with food even on a war basis. The committee demands abolition of government control of the distribution of meat, sugar, grain, and potatoes. This statement would appear to be partly propaganda in order to create sympathy in foreign countries, and partly in the interest of the farmers, who wish to sell where and when they please and at the highest possible prices. There is, however, no doubt also that the agricultural situation is poor through lack of fertilizers and through years of neglect of the agricultural regions.

Military.

The president of the Republican Army Officers' Club has published an article claiming that conditions in the army are rapidly becoming untenable and that reactionary officers are deliberately undermining the armed forces of the republic. In opposition to this statement is, of course, the declaration of the extreme socialists that the reactionary Army officers are obtaining complete control and are building up an efficient army with thoroughly reactionary principles and leaders.

Organization of Youths in Germany.

One of the most interesting recent developments in Germany is the rapid growth of the various youths' movements. The different German political parties see in the training of the young people of both sexes along specified lines the best future for those parties. These organizations of the youths are of all shades of political opinion from the German National Youths' Union down to the Free Socialist Youths' Union which has recently declared itself communistic. As might be expected, the two most active and effective organizations are those at the two extremes, because they have definite organizations and can make something more than vague general promises. All of these unions are supposedly made up of youths from 14 to 20, but, as is quite natural, it often happens that the policy of the different unions is largely formulated by older people.

The German National Youths' Union has centers all over the country and is thoroughly well organized. It is reactionary, but reactionary with a program. All emphasis is laid on the past glories of the Fatherland. In the public recruiting meetings the party political standpoint is often strongly emphasized in such words as the

following: "We who feel ourselves to be German nationalists desire to perpetuate the spirit of the Hohenzollern within us," or "we consider it our highest aim to bring it about that Germany will recover its Emperor." The influence of this union extends very largely into the schools; it was the union which made most of the trouble about the banishment of Hohenzollern pictures from the schools. In many instances the union is supported by the professors and teachers, much to the dismay of the social democratic government, which fully realizes the reactionary danger of such a movement in the educational field. It must be admitted, however, that in the German National Youths' Union there seems to be a rather fine and manly spirit backed by real enthusiasm.

There are many intermediate organizations representing more or less the ideas of the different political parties, although when one gets away from the two extremes there is more of an attempt to divorce the organizations from a purely party affiliation. The democratic youths claim the right to prepare German young men for the new tasks of the new time and state that those who look only to the past and hold fast to the "pillars broken forever" will not be able to collaborate in the future democratic growth of the nation.

The Democratic Youths' Union, of greater Berlin, which is perhaps the strongest of these organizations, is forming groups for youths still subject to compulsory education. It includes boys and girls up to 18 years of age. There is no intention to drill the members in a political party sense, but the groups are to have excursions, lectures on all subjects, entertainments of all kinds; the purpose is primarily a negative one, to keep these boys and girls away from the reactionary influence of the German National Youths' party. The democratic organization has a magazine called the Democratic Youths in which all democratic groups shall have the right to voice their views. The youths shall have the right to express their views, but also experienced leaders shall address the youths in this journal freely and without reserve. In one of the early numbers of the journal Dr. Hugo Preuss, formerly a federal minister, published an article summing up the purpose of the Democratic Youths' Union. He points out that in the first half of the nineteenth century Germany had an opportunity to take her place among the nations by becoming more progressive than other nations and by forming a democratic federalized state. The Empire, however, was created and its economic success made the German people adherents of an obsolete political system. "It was especially the desolation and torpidity of its political spirit which permitted Germany to glide into the World War and to collapse in it. From this collapse young German democracy had to grow from inner necessity. There was, there is, no other driving power which could awaken the Ger-

man national spirit, which could take in hand the reconstruction of the German realm, than this very driving power of the democratic spirit. Therefore democracy must again become the common treasure of German youths if they desire with all power to reerect their fatherland and to prepare for Germany a better future among the nations of the world." Preuss points out, finally, that "Democratic sentiment signifies to-day no longer mere enthusiasm for some sort of far-away idea, but serious, active work on the firm platform of reality; the new democracy is no condition fixed and hardened once and for all, but on the contrary, it needs continuous development and enlargement."

This is all very fine, but it is all general, and generalities which do not even suggest possible specific action to bring about the radiant future contemplated can not hold the enthusiasm of youth. It is true, therefore, that although the intermediate organizations may have the finer and truer ideals, they have not the enthusiasm of the Nationalists and the Communists.

There are, of course, socialist youths' organizations, but those of the majority socialists are on the whole as spineless as is the majority socialist government. The most active of these was the Free Socialist Youths' organization, membership in which was limited, theoretically at least, to the sons and daughters of the working people. Here, however, the program was not sufficiently definite. The organization was controlled altogether too much by older politicians, who attempted to put into a youths' movement a political program which belonged really to a party convention, with the result that at a general meeting in October the organization broke in two. The large majority came out definitely on the side of the communist party. This majority did not understand and could not have understood all the implications of the communist theory, but the older communist leaders were fired with enthusiasm and carried the children with them. It was a good example of the success of Lenine's order to propagandists in foreign countries that in preaching communism they must address themselves to young people who are more easily influenced.

This desertion to the ranks of the communist party of so many members among the Free Socialist Youths has been a real blow to the movement, so far as the Socialists are concerned. The only hope is as Freiheit, generally ultra radical but in this matter fairly sensible, points out, that the communistic section will cease to be in any way a movement of the youths themselves and will be so dominated by the older people that it will cease to have vitality.

The interesting point in the whole movement is that the various political parties evidently realize the vast importance of training young people in political thinking. The working out of the move-

ment must also be of interest in that it will prove whether children can or should really be trained along narrowly political party lines. Perhaps in the end the program of the democratic youths' union, of entertainments and discussions, divorced from narrow political issues, will be the most effective, in that it will outlive the youthful enthusiasm engendered by the program of the National Youths' Union and the Communist Youths' Organization.

THE SPANISH ARMY AND THE CORTES.

Source: Reliable.

1 December 1919.

(10146)

Several years ago, to give the average officer in the Spanish Army a chance for promotion, a society was formed called the "Juntas de Defensa." This was considered necessary on account of the general belief, borne out by promotions made, that the only officers who had a chance for duty in Madrid and other desirable posts and the only ones who stood a chance of promotion to the higher commands were those who were personally known and liked by the King, or who were friends of men who were close to the King.

Soon after the organization of the society the members themselves were surprised to find the power and influence the society had. With the realization of their power came the desire to have an influence in politics as well as in purely military questions. In 1917 the Juntas de Defensa dictated the appointment of Senor Juan J. La Cierva, a civilian thoroughly in sympathy with the political ideas of the juntas, to the portfolio of minister of war. This appointment was the first and last appointment of a civilian as minister of war since the Republic in 1873. During La Cierva's tenure of office as minister of war the Juntas de Defensa, through the colonel at the head of the society, was for all intents and purposes the secretary of state for war. All army politics were dictated by it.

When the Government of which La Cierva was a member fell, due to the very serious disorders in the summer of 1917, and with the dismissal of the colonel at the head of the society from the army, the Juntas de Defensa was supposed to be suppressed. It was not, in fact, and since that time until the present it has gradually been regaining its old power and its old desire to interfere with the army administration.

A short time ago the Juntas de Defensa decided, probably partially for the good of the army, but more particularly for the abolition of caste in the army, that the general staff of the army should be changed from a permanent corps, as it is now, to a body

of officers detailed from the different arms of the service and subject to periodical return to duty with the troops. In the endeavor to force this change, they asked 24 officers of Infantry, then at the Superior War School, if they would be willing, after their graduation from the school, to be still considered as infantrymen, detailed for general staff duty, but subject to return to duty with troops in their branches of service. These 24 officers replied that they would not; that they wished to become permanent general staff officers on graduation. They were then informed by the Juntas de Defensa that they would have to agree to be subject to detail with the troops. In reply to this demand the 24 officers resigned from the Juntas de Defensa. A court of honor was demanded by the Juntas de Defensa and was ordered by the proper superior authority. The court of honor decreed that 16 of these 24 officers should resign from the service. These 16 officers ejected from the army appealed to the supreme council of war. The supreme council of war, being composed of senior generals, of chief officers of the army, and of men who were appointed under the old régime before the organization of the juntas, and who consequently have no love for the Juntas de Defensa, decided, by a vote of 12 to 2, that the organization of the court of honor was illegal and decreed that the officers forced to resign should be reinstated in the army.

The Cortes, in the last few days, has paid a great deal of attention to the question of the Juntas de Defensa and in Friday's debate all the leaders who spoke, with the sole exception of Señor La Cierva, said that the Juntas de Defensa was illegal and that there could be no question of the supremacy in Spain of the civil power over that of the military.

Unless the Juntas de Defensa make a violent and successful protest against the decision of the supreme council of war and are able to bring enough influence to bear to get a reversal of the attitude of Congress, their power and influence in the country can be considered as very nearly completely destroyed. The present opinion is that they will not attempt to override the rulings of the council of war nor will they be able to change the sentiments in Congress, and that as a strong force in the country they may be considered as finished.

OPERATIONS.

JAPAN—GRAND ARMY MANEUVERS.

Source: Reliable.

10 November 1919.

(12486)

The maneuvers were held in the vicinity of Kobe and Osaka, the great commercial and industrial region of Japan. It is, at the same time, the center of social disorder and labor unrest. It would therefore seem reasonable to suppose that there was a more or less political reason involved in the selection of that site. The area is highly cultivated and most thickly populated, rendering it unsuitable to a degree for maneuver purposes; however, such a spectacle stimulates patriotism and popularizes the army, among the lower classes especially. The frequent sight of the Emperor and Crown Prince, or other high dignitaries and officials as well as the changing scenes afforded by the different arms of the service, the sight of an occasional aeroplane and the sound of gun and rifle fire, all brought an element of the theater right to the door of the simple-minded peasant. The response was enthusiastic—streets and roads were so crowded that it was most difficult for even a single horseman to get through. Every ridge or other point of vantage was occupied.

In general, it may be stated that no great tactical advantage is derived from such maneuvers. They do, however, give opportunities for the exercise of command of comparatively large bodies of troops, with the attendant problems of transport and supply, while the soldier has abundant exercise in marching. The greatest profit, undoubtedly, is psychological—they stimulate enthusiasm and patriotism and popularize the army. As one general staff officer remarked, "The maneuvers are only a theatrical performance for the benefit of the Emperor and the people."

The foreign military attachés were, as usual, the guests of the imperial household. Special officers were detailed in charge of them, and much thought and care was devoted to their entertainment. The imperial maneuvers entail quite a social program—such as calling on the Emporer, Crown Prince, and other high dignitaries and officials, dinners by local mayors, the chief of staff, local rich men, etc.

It is interesting to note that Prince Fushimi and Prince Kanin were entertained at the houses of so-called "narikin" (newly rich). The Emperor received in audience the heads of various large business concerns of Kobe and Osaka. Special attention was paid by the Japanese officers to the British attachés.

General Plan.

The general scheme for the maneuver was the attack and defense of the cities of Kobe and Osaka. The defensive army (red) consisting of the Tenth and Fourteenth Divisions (plus two imaginary divisions) under Gen. Shiba, defended those towns against a blue army consisting of the Eleventh and Seventeenth and two imaginary divisions under Gen. Akiyama. In general it comprised a retreat of the red army in the direction of Osaka, pursued by the blue army, until the final pitched battle on the last day of the maneuvers. As a general thing, everything went according to schedule, and the position of any large unit at any time could be easily foretold.

Tactics.

The tactics and formations used were similar to those employed by the Germans in the early stages of the war. A foreign attaché who has attended the maneuvers for the past five years, remarked that no change had taken place during that period. Nowhere did they display any practical application on the lessons of the late war, except, perhaps, to a limited degree in aviation. "I saw mountain artillery, machine guns, and Infantry, all on the same line, within 300 yards of the enemy front line." (Statement of American military attaché.) Infantry attacked in dense lines, not echeloned in depth, without any regard for enemy machine gun or rifle fire. One colonel of Infantry personally directed his front line. The predominant idea, as of old, was to charge, irrespective of enemy fire action, and without the protection of their own. As a general proposition it may be said that an army employing such tactics against one that had put into practice the lessons learned in the late war would have but little chance of success.

However, it is not to be supposed that such a state of affairs will continue long in the Japanese Army. A board of their best officers is now at work digesting the lessons of the European war, and we may expect a radical change within the next year. Even then, however, we may expect a more massed formation than was found in any of the recent allied armies. The Japanese has no great individual initiative, is not a quick thinker, and to do things well must usually do them in a mass. An excellent illustration of this tendency may be seen in their theory of the advance guard, which is not liable to change for some time at least. Instead of an advance guard as we know it, the division commander himself (or army com-

mander), commands and employs practically the whole of his force in the advance. In other words, the whole force is deployed, and moves by a series of bounds from one selected position to another. The fatigue of the men consequent to a continual advance in this manner is not considered of any great importance. I saw such a method of advance during the maneuvers result in bringing division headquarters infantry in column of squads, and field artillery on the road, under machine-gun and rifle fire at about 800 yards range.

Matériel.

Nothing new in the way of matériel was seen. The Infantry equipment was the same as in previous years, including neither helmets nor gas masks. No grenades, automatic rifles, 37-mm. guns, trench mortars, anti-aircraft guns, searchlights, flares, or tanks were in evidence. The 1905 machine gun, only, was used, although it is known they have a newer model. Mountain, field, and heavy artillery were the same as in former years. Among the little things might be noted a rather convenient pencil, constructed on the general plan of a pair of dividers, with blue lead in one leg and red in the other. Maps, in dry weather, were suspended by a string around the neck which held two ordinary clips, the map being held by the clips. This is a small matter, but it is rather important, as frequently men will not take the trouble to look at a map unless it is quite convenient.

Infantry.

The Infantry showed its usual sturdy, hard-marching qualities. Marches of 40 to 50 kilometers were the rule, ususally with the pack kept on almost the entire time, and with but little rest at night. Stragglers were very rare. For four nights the greater part of the Infantry could not have had more than two or three hours' sleep, and that in the open with nothing but a waterproof sheet. Their endurance is remarkable, and they double-time for longer distances and less fatigue than any troops I have ever seen.

Their tactics were bad from the present-day standpoint, as has been noted above. They showed a fondness for firing from a sitting position without any great amount of care while firing. Maneuver bravery was very much in evidence and no particular attention was paid to enemy fire, even at very short ranges; the predominant idea was to charge at every opportunity. One regiment had camouflaged their caps by covering them with straw, which was very effective in the rice fields.

Machine Guns.

The Infantry carried the 1905 model on pack horses, one machine gun company with four guns per regiment. When unlimbered for firing, the piece is carried by four men, two carrying the tripod and

two the barrel. The tripod has projecting handles for carrying purposes. There are 1,800 rounds of blanks with each gun, 600 per box. A box was carried for short distances on a man's back.

The guns were employed in pairs, placed in the open with no digging and no camouflage. They were usually on the front line with the Infantry, often within 50 to 300 yards of the enemy front line. There was one pair of guns, firing from a slight elevation over the heads of its own charging Infantry at a range of about 350 yards.

The pack horses and packsaddles seemed strong and serviceable. The new machine gun was not brought to the maneuvers.

Artillery.

Artillery was represented by mountain and field artillery (both 7.5 cm.), and the 12 cm. and 15 cm. horse-drawn howitzers. The latter is drown by 8 horses, and the 12 cm. by 6, as it is but little heavier than the field gun. No new models were seen.

The mountain artillery is fitted for either pack or draft transportation; if the latter is used, each piece is pulled by one horse, and seems to be well adapted to that mode of transportation. As to the tactics of the arm, every time this gun was seen it was well up in front, sometimes even on the front line. At one time it occupied the crest of a well-defined hill, three guns spaced about 10 yards apart, while the other gun was some 200 yards away with the Infantry support. They were camouflaged by means of a rope net covered with branches—fairly effective from the front, but visible from the air. Only direct fire was observed. The position itself was not well chosen, as that particular hill would have been the first target for hostile artillery, while bombing planes could have made it untenable. At another time it was in action, direct fire, at a distance of 300 to 400 yards of the enemy line.

Field Artillery was seen in action several times, and on the road as well. Nothing but direct fire was used, without much attempt at camouflage, but as a usual thing digging in and camouflage were apparently assumed. The small horses seemed to be able to pull the gun very well under the conditions observed, but it must be difficult in bad weather, especially off the roads. The horses were in good condition and were fairly well kept. The harness, however, needed oil or saddle soap very badly. As a rule, the Japanese pay very little attention to the care of leather equipment. A little dubbin is rubbed on the parts coming into contact with the horse, while the remainder is rarely touched.

The 12-cm. and 15-cm. howitzers were only seen on the road. Some one said during the maneuvers that a 15-cm. battery had marched 40 kilometers in eight hours, but was unable to verify it.

At present howitzer batteries are not component parts of a division. However, newspapers state that this year's budget contains a provision for assigning one battalion of 15 cm. to each division, and that preparations have already begun for incorporating it in the division.

Cavalry.

Very little was seen of the Cavalry. It was not used independently, although the problem, from our standpoint, was essentially an independent Cavalry problem. It was closely supported by Infantry, and frequently the Infantry was up with it. Due to this, touch was not maintained by the pursuing army with the retreating army. A division commander at one time found two battalions of the enemy within 800 yards of his headquarters, which had not been reported to him by the Cavalry. Their only means of communication, apparently, was the mounted messenger.

Transport.

The transport consisted of the usual one-horse cart, supplemented by carts requisitioned in the neighborhood. The greater portion of the rations and forage were bought in the vicinity previous to the maneuvers and collected in storehouses. The carts were used between the storehouses and the organizations. Motor trucks were used with the wireless and aeroplane sections only. The narrow, crowded roads and streets would have made any other transportation than the cart almost impossible.

Air Service.

The instruction given by the French aeronautical mission during the past few months was plainly evidenced by the improvement in this year's flying over that of previous years. Twenty-four planes (Sopworth, Farnam, and Nieuport) were used at various times during the maneuvers, a big advance over that of last year. Thirteen was the greatest number observed in the air at any one time, and usually the number ranged from three to seven. Planes were fitted with machine guns and wireless. It is known that the latter was not used, and nothing was heard of the use of the former. Bombing was simulated, some pictures were taken, and at least one message and position sketch was dropped. As a general thing the plane was mainly employed in practice flying, and was no particular factor in the maneuver itself. As usual, foolish chances were taken by some aviators, such as diving within 50 feet of the ground, where there was no landing place. That the engines worked so well may be largely attributed to the French mechanics. I saw one position sketch dropped by an aviator near division head-

quarters. The position sketch did not show two enemy battalions forming the rear guard of the retreating enemy.

A good authority states that about 30 pilots have been trained by the French, but not all of them are efficient. An English aviator told me that the degree of efficiency attained by the Japanese aviators at the maneuvers, was about the same as that of his own pupils after 10 hours in the air.

Communications.

The following means of communication were employed: Telephone, wireless, pigeon, motorcycle side car, bicycle, mounted messenger, runner, flag.

Theoretically, there is telephone communication down as far as battalion headquarters, and from division headquarters to headquarters trains, Artillery, Cavalry, etc. Actually, however, I saw times when there was little if any wire communications of any kind. Certainly there were times when there was no wire to regimental headquarters and I am of the opinion that that was the rule rather than the exception. Wire was usually strung by a man on foot; I saw one instance of it being strung by a bicyclist, the small reel being suspended from his shoulders.

Wireless is theoretically used between divisions and back to army headquarters; brigades and regiments were not supplied with wireless. Only one wireless mast was seen during the maneuvers. Aeroplanes were fitted with wireless sets for communication with the ground, but did not attempt to use them. No attempt was made from ground to plane.

Pigeons were released at various times during the maneuvers, more for practice flights than for actual means of communication. About 60 were released on the parade ground immediately following the grand review which marked the close of the maneuvers. The pigeons used were part of the thousand brought over by the French in June of this year.

A few motor cycle side cars, mostly Indians, were used for communicating purposes. An innovation, which has some points of vantage, was noticed in providing higher staff officers with side cars mounting machine guns. It is considered that the machine guns form a reserve that might be useful in an emergency.

As a rule, the bicycles employed were rented for the maneuvers and in some cases the messenger was the owner of the bicycle. It is said that a division should have about 100 machines, but that they have only a few.

The mounted messenger and runner showed no special features. The runner receives special training; those I saw carried the rifle and full pack. The only flag signaling I saw was one instance of

the use of the semaphore, the signaler standing just in rear of the firing line.

One point to be noted occurred in the first day's maneuver. Two divisions moving side by side to the attack, lost communication and the attack was begun by one division without knowing just where the other one was.

Special Observations.

In addition to the general round of observation, special permission was obtained first, to see a division's dispositions for the night, and second, to accompany a division headquarters during a portion of the exercises.

Division headquarters was in a village, having moved there after the cessation of the day's maneuvers at 2.45 p. m. At 7 p. m. telephonic communication had not yet been completed, although it had involved a move of a few hundred yards only from a former message center. Brigade headquarters was within 300 yards of the front line. It will be noted that the brigade adjutant's duties are confined strictly to those of an adjutant—the brigade commander is required to attend to his own orders and operations. Only in case the brigade is reinforced by the addition of other arms, is there a general staff officer furnished.

The dispositions for the night comprised a strongly held front line with a very few weak patrols some 200 to 300 yards to the front. The men were lying on the ground, side by side, the trench being simulated; it would have been difficult to have placed more men in the actual front line. The reserves were some 200 to 300 yards to the rear. From our standpoint there was far too much massing of men in the front line.

On another day I accompanied a division headquarters during a morning's maneuver. Division headquarters in the field is quite mobile, the officers are mounted, and there is but little impedimenta.

The general staff attached to headquarters consists of a chief of staff and three other officers. Theoretically, the work is not divided into bureaus as in our own, and much stress is laid upon the necessity of one officer being able to do the work of another if necessary, and all get the same training. Actually, however, the work becomes more or less specialized, and in the last analysis does not differ greatly from our own practice. Different groups, such as the brigade of Infantry, the Artillery, Cavalry, Engineers, trains, etc., have a liaison group with division headquarters; orders are dictated by the chief of staff to a representative of each group, who transmits it by some means of communication, is theoretically maintained with the headquarters of the various groups. All liaison officers keep in touch with the general situation, so that they can keep their own

commanding officers informed. The absence of chairs, tables, and motor cars is noticeable.

Upon changing his headquarters the division commander simply notified the liaison officers to meet him at the new headquarters and telephoned its location to the various headquarters. Leaving a staff officer at the telephone he rode to the front toward his new headquarters. During his move and for some time thereafter he was without communication with his command. In this particular instance division headquarters, field artillery, and infantry were all on the front line, within some 800 yards of the enemy rear guard. The tendency to shove all headquarters and the field artillery well to the front is to be noted.

While the Japanese apparently sacrifice too much to mobility of division headquarters it is possible that we err too much in the opposite direction.

Grand Review.

The maneuvers terminated in a grand review before the Emperor and Crown Prince on the parade ground at Osaka. Four divisions plus some heavy artillery and other army troops participated, it being witnessed by an immense crowd. Aeroplanes flew singly or in formation over the field, and a flock of pigeons was released at its conclusion. In all, it was a very soldierly and impressive formation.

Organizations of all arms paraded at far below peace-time strength. Infantry companies were rarely 100 strong, and the four divisions had less than 21,000 infantrymen. Reserves were not called out for these maneuvers.

The divisional engineers, comprising 3 battalions of 3 companies each, with from 90 to 100 men per company, were massed in rear of the infantry. In addition, there was a section of communication troops of about 75 men with each battalion.

In all, it is not believed that there were more than 27,000 troops participating in the review.

The animals appeared to be in good shape, though not particularly well groomed. Arms and equipment were clean, although, as already noted, all leather equipment needed oil or soap.

General Conclusions.

It is not difficult to judge the value of the maneuvers; it is another matter, however, to draw conclusions as to the value of the military machine from what was shown during the maneuvers. It can be said, however, that men, horses, and equipment appeared serviceable, the men well disciplined, and well trained in their present tactics. As usual, they showed great endurance, and can be counted upon to withstand well the hardships of a campaign.

Tactically, they are behind the times, but that is a matter that can be rectified within a comparatively short time. They are still in the prewar state of arms and equipment. To rectify this will, of course, take considerable time, but there is reason to suppose that steps are now being taken with that end in view. Taking into consideration the state of their air service, it would seem that about two years would be necessary to adequately arm, equip, and train the present army so that it would be prepared to meet a modern army.

FRENCH MINE-SWEEPING BOARD.

Source: Reliable.

29 October 1919.

Establishment, Attributions, and Administration of the Permanent Mine-Sweeping Board.

ARTICLE I.—(1) The mine-sweeping board of practical investigations is established at Brest.

(2) It is under the immediate orders of the prefect maritime of the second arrondissement.

This general officer prescribes all measures necessary to insure the proper operation of the board.

(3) Respecting its connections with the other investigating organizations of navy and with scientific organizations both French and foreign, the permanent mine-sweeping board is subordinate to the directing committee of inventions and research pertaining to the navy, the location of which committee is at Paris.

ARTICLE II.—(1) The board includes within its attributions the investigation of all questions concerning:

Mine sweeping.

Apparatus for protection against mines.

Foreign mines (in liaison with the C. E. P. E. T.[1]).

Mine-swept channels (chenaux de securite).

(2) The department consults the board before passing and deciding on the propositions coming from the arrondissement authorities, and concerning the preparation for the defense of mine-swept channels.

Administration.

ARTICLE 3.—(1) The permanent members of the board are on shore duty. The personnel attached to the board and not on board ship is subsisted by the first administrative center.

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[1] C. E. P. E. T. are initials of Commission d'Etudes Pratiques, Electricite, Torpilles.

(2) The board and the personnel attached to it forms a distinct administrative group administered by the first administrative center of Brest.

Personnel.

ARTICLE 4.—(1) The permanent mine-sweeping board includes—

Permanent members;

Associated members, called upon to temporarily form part of the board, empowered to vote concerning investigations of questions which come within their special province;

In addition, the president may request the attendance, in a consultive capacity, of any person, the attainments of whom he may judge are of a nature to be useful to the board.

(2) The permanent members are—

(1) An officer of command rank (officer superieur), president;

(2) An officer of command rank, vice president;

(3) The lieutenant commanding the vessel permanently assigned to the board as recorder and custodian of records;

(4) The lieutenant chief of the mine-sweeping flotilla, in time of peace, assigned to the second arrondissement;

(5) A naval constructor.

When the board is conducting experiments or tests of mine-protecting apparatus, light mine sweeping, or other apparatus necessitating the assignment of a special vessel, the officer who commands this vessel forms part of the board.

In time of war, the president of the board performs the functions of inspector of mine sweeping. During his inspections, he is replaced at the head of the board by the officer of command rank, vice president.

Designation and Duration of the Functions of the Members of the Commission.

ARTICLE 5.—(1) The permanent members of the board are designated by the minister of the marine, on the formal recommendation of the prefect maritime of the second arrondissement.

(2) The associated members are designated by the prefect maritime of the second arrondissement from amongst the qualified specialists stationed in the arrondissement, and on the formal recommendations of the board.

The minister of the marine may add to this catagory of officers members who are not of that arrondissement.

(3) The duration of the functions of the officers who are permanent members is, as a general rule, fixed at two years. It may be prolonged one year at a time.

The entrance into office of these officers is preceded by a period of instruction of 15 days.

Personnel Attached to the Board.

ARTICLE 6.—(1) The vessel assigned permanently to the board has a special complement fixed by the department in accordance with recommendation of the President.

The complement includes—

(*a*) The personnel necessary to the operation of the small workshop on board the vessel;

(*b*) A machinist's mate (maître mecanicien), charged with directing the workshop, with the upkeep of the mine sweeping and mine museum, and to act as instructor of the machinists under preliminary instruction at the mine-sweeping school;

(*c*) The instructional personnel necessary for the operation of the school.

(2) In addition to the personnel specified in paragraph 1 above, there shall be attached to the board the following:

One rated chief clerk of the secretary's office (yeoman, second or third class, if possible).

Two machinist draftsmen (one third-class petty officer, one seaman mechanic).

One typist.

One office custodian.

(3) The mine-sweeping expert personnel (working crew, workshop personnel, instructors, draftsmen) is designated on formal recommendation of the president of the board.

(4) The duration of the tour of duty of the personnel attached to the board is regulated by the usual rules applicable to personnel either on sea or shore duty.

However, the president of the board may recommend to the department an extension of the tour of duty in the case of the expert mine-sweeping personnel which he may consider as indispensable to the success of investigations already under way.

Operation of the Board.

ART. 7.—(1) The permanent mine-sweeping board will proceed either on its own initiative or on orders issued by the authorities to which it is subject, to the consideration of the investigations specified by article 2 of the present decision.

The order of urgency in which these investigations are to be taken up will be fixed by the department.

(2) In the prosecution of its work the board will have exclusive use of—

(*a*) Buildings on shore where the offices, records, instruction hall, mine-sweeping museum, warrant officers and machinists under instruction, etc., will be installed or quartered;

(*b*) A vessel for conducting experiments which shall be permanently attached. A small workshop will be installed on board for the purpose of enabling minor modifications, found necessary during the course of experiments, to be effected. In the case of important work, application for assistance shall be made to the various administrations;

(*c*) Other vessels and especially a fast vessel for the study of mine sweeping and light mine-protection apparatus will be placed at the disposition of the board by the prefect maritime of the second arrondissement, at the request of the president, whenever they are found necessary.

(*d*) The one mine-sweeping flotilla attached to the second arrondissement during peace time may be placed at the disposition of the president of the board at his request by the prefect maritime of that arrondissement, either during the course of the periods of preliminary instructions at the school or for the technical researches of the board. Requests of this nature must be presented in ample time and cover a period of sufficient extent to enable the commander of flotillas to draw up the necessary training program of the flotilla.

Procedure—Method of Working.

ARTICLE 8.—(1) The president directs the work and decides on the program and working hours of the board.

(2) A recorder is appointed to specially follow the study of each of the questions under examination, to account for the experiments, and recommend conclusions.

In case of questions concerning long investigations or of special importance a committee may be designated for their consideration.

(3) The president shall submit the report of the committee or of the recorder to the examination of the board. The report is adopted if it meets with the approval of the majority of the board; in the contrary case, a new report will be drawn up embodying the views of the majority of the board.

In case of equal division of the votes, the vote of the president shall be decisive.

In case of divergence of views, the opinion of the minority members may be annexed to the report.

Correspondence, Reports, and Proceedings.

ARTICLE 9.—(1) As a general rule, the correspondence of the board is to be transmitted through official channels.

(2) However, the reports and proceedings of the board are distributed directly by the latter in the following manner (without prejudice to eventual addresses specified in article 14, paragraph 2).

Archives of the board.
Permanent members of the board.
Interested associated members.

Other investigating organizations.

C. E. P., E., T. (Commission d'Etudes Pratiques, Electricite, Torpilles).

Ministry of the Marine.

E. M. G., 5, two copies (general staff 5, 2 copies).

E. M. G., 4.

Managing committee of investigations.

D. C. C. N. (direction centrale de constructions navales).

Perfect maritime du second arrondissement.

D. C. N., Brest (direction des constructions navales; Brest).

Naval forces (rear admiral, president of the permanent board).

The reports shall be drawn up separately and distinct for each question treated.

Material.

ARTICLE 10.—(1 The material necessary for the investigations of the board is manufactured or acquired, on an order from the prefect maritime, by the administrations or services of the port which provide, each one as far as it is concerned, for the expense of labor and material resulting from the work or experiments of the board.

(2) A sum of 1,500 francs is annually placed at the disposition of the president of the board, subject to being accounted for in the usual way, to be used for minor purchases on the spot of the material the administrations are unable to procure.

Mine and Mine-Sweeping Museum, Archives, Library.

ARTICLE 11.—(1) The board is charged with the maintenance of the mine and mine-sweeping museum, created by ministerial order. The board will take or provide all necessary measures of a nature to facilitate the maintenance of this museum up to date.

As a general rule, the museum is only open to the personnel of the board and to the students of the mine-sweeping school. However, the authority to visit it may be given to officers of the French Navy by the president of the board.

(2) The archives of the various services of the ministry and the maritime arrondissements are placed at the disposition of the permanent mine-sweeping board for the purposes of research and communication of documents which might be useful to the board and which it might not have in its possession.

The services shall send to the board moreover, on their own initiative, all documents existing in the archives which they may consider susceptible of interesting the board.

The board will receive from the above-mentioned services copies of general orders (orders de principe), special orders (depeches), circular letters, decisions, reports and studies of any nature interesting the objects of the board's work.

(3) With a view to assuring the operation of the archives and of the secretariat of the board, the president shall receive an allowance the amount of which will be determined annually. In time of war the necessary office stationery will be delivered to the president in kind.

(4) A credit of a certain sum of money will be placed each year at the disposition of the board for the purchase of technical works and reviews.

Besides this annual credit, the board shall receive an exceptional allocation of 200 francs for the purchase of the first necessary works.

Assistance to be Given to the Board.

ARTICLE 13.—In general, the various departments of the navy which may be able to assist the board will do so at the request of the president.

ARTICLE 14.—(1) The board may have itself represented at the trials and exercises relating to mine sweeping which may be conducted in the different arrondissements.

The reports of all the tests and exercises of this nature are communicated to the board for its information by the chief of the offensive and defensive services of the arrondissements.

2. The permanent mine-sweeping board will keep itself in communication with other boards and centers of investigation and shall request, if necessary, their cooperation in so far as concerns questions under their cognizance.

These boards or centers of investigation will bring to the attention of the permanent mine-sweeping board, in so far as comes to their knowledge, all matters which appear to them likely to be applicable to mine sweeping and mines.

The members of the permanent mine-sweeping board may be directed to assist in the experiments conducted by other boards.

The board and other centers of investigation shall exchange quarterly reports, likewise their reports drawn up on kindred questions specified in the preceding paragraphs.

In particular, the C. E. P. E. T. shall address to the C. P. D. a copy of all the investigations interesting mines.

3. The permanent board of mine sweeping is accredited by the department of the marine (directing committee of inventions and research) to the organizations other than those of the department of the marine.

Reports Rendered Periodically.

ARTICLE 16.—(1) The board shall draw up monthly:

(*a*) The list of questions, investigations, and experiments submitted to the examination of the board; this list shall mention in connection with each question:

The references to the D. M. (depeche ministerielles—ministerial special order), local orders, and reports of the board relating thereto;

The general results previously required;

The results required, the experiments effected, the work undertaken during the course of the month which has expired.

Observations summarizing the future program to be considered, designating, if necessary, the officer specially charged with the investigation, mentioning propositions under way not yet terminated.

(*b*) A memorandum summarizing the status of the material belonging to the board which should be replaced or acquired.

(*c*) Any new propositions which the president might judge necessary to formulate.

(2) The board shall draw up quarterly instead and in place of the monthly report a general report on the status of its work; it will propose therein the new investigations to be undertaken.

(3) The reports forming the subject of paragraphs 1 and 2 above shall be forwarded in duplicate to the department.

Mine-Sweeping School.

ARTICLE 17.—(1) The mine-sweeping school has for its object that of giving instruction relative to the utilization of both mine-sweeping apparatus and mines.

First.—To a certain number of officers of command rank and of junior grades.

Second.—To a certain number of warrant officers intended to fulfill the functions of commanding officers on board mine-sweeping vessels or that of chiefs of mine dredgers.

Third.—To a certain number of second-class petty officers and second-class machinists intended to assure the upkeep and the minor repairs of the special sweeping and mine-protection apparatus.

(2) Each year includes six periods of instruction, which begin:

For the officers, the 1st of June and September.

For the warrant officers, the 1st of February and November.

For the machinists, the 1st of April and October.

The duration of the periods of instruction for the officers and warrant officers does not exceed one month; it is determined by the commandant of the school.

The duration of the periods of instruction of the second-class petty officers and second-class machinists is 15 days.

Officers' Periods of Preliminary Instruction.

ARTICLE 18.—(1) The period commencing the 1st September is reserved for officers of command rank destined in time of war to be chiefs of mine sweeping and to officers below command rank commanding mine-sweeping flotillas in time of peace.

(2) The period commencing June 1 is reserved for officers other than those designated in paragraph 1, officers who are desirous of obtaining the mine-sweeping certificate.

The number of such officers permitted to take the preliminary course of instruction is fixed by the department in proportion to mine-sweeping certificate and also to the duration of validity of the certificate which period depends on the rapidity of change in the type of the apparatus.

These officers are recruited from all the naval department of the Republic, either on shore or sea duty. Their application to be sent to the mine-sweeping school for the preliminary instruction must be received before April 15, through official channels, at the department (direction of naval personnel) which makes the assignments at the appropriate time.

3. The instruction to be given to the officers is both theoretical on shore and practical on board ship.

The theoretical instruction includes the complete description of mine-sweeping and mine-protection apparatus, its use, the operations of a single mine-sweeping vessel and that of a group, the different varieties of mine sweeping to be effected, the operation of a flotilla, the drawing up of reports concerning mine sweeping, countability, and the upkeep of the apparatus.

The practical instruction includes the handling of a mine-sweeping and mine-protection apparatus, the handling of a single mine-sweeping vessel and of a group of the same, the execution of different varieties of mine sweeping.

4. At the termination of each period an examining board designated by the prefect maritime of the second arrondissement subjects the officers under preliminary instruction to an examination, following which the board recommends through official channels those officers whom it considers qualified to receive the mine-sweeping certificate.

5. As soon as the session is terminated, the officers are sent back to their respective duties.

6. For the instruction of officers the flotillas of two arrondissements (first and second, or second and third) may be combined and placed at the disposition of the commandant of the school, at the request of the latter, and after an agreement between the two prefects maritimes interested.

Preliminary Instruction of Warrant Officers.

ARTICLE 19.—(1). The number of warrant officers to be admitted each period is determined by the department in accordance with considerations analogous to those indicated in article 18, paragraph 2, for the officers.

The warrant officers are recruited from all the naval departments of the Republic, either on shore or sea duty, and from amongst the deck ratings, from the signal men, from the pilots and master pilots.

Their application to be sent to the mine-sweeping school for preliminary instruction, must be received prior to December 15 and November 15, through official channels, at the department (direction of naval personnel), which will determine the appointments at the appropriate time.

2. All warrant officers under preliminary instruction receive the instruction necessary for a chief of mine-sweeping crew. The second-class petty officers (second maitre) only receive instruction in the following: Description of mine-sweeping and mine protection apparatus, its upkeep, its repairs, and its handling. The petty officers, first class and second class (premiers maitres et maitres), are furthermore exercised in handling a mine-sweeping vessel acting singly, a mine-sweeping vessel in a group and a section composed of three mine-sweeping vessels.

(3) At the termination of each period the warrant officers under preliminary instruction are examined by a board appointed by the prefect maritime of the second arrondissement, on the subject matters which have been taught them. They are marked on a scale ranging between 0 and 20, and those who obtain a mark at least equal to 12 receive the mine-sweeping certificate.

The award of this certificate carries with it the cession of a certain number of supplementary marks ranging from 25 to 50.

(4) As soon as the session is terminated the warrant officers are sent back to their various stations.

Preliminary Instruction of Machinist's Mates, Second Class, and Engine Men, Second Class (Second-Maitres et Quartiers-Maitres Mecaniciens).[1]

ARTICLE 20.—(1) The number of machinist's mates, second class, and engine men, second class, to be admitted at each period is determined by the department.

This personnel is recruited from all naval services of the Republic, on shore and afloat. It is designated by the department.

(2) This personnel receives special instruction relative to mine-sweeping and mine-protection apparatus.

(3) At the termination of each period the men of the above ratings who give proof of sufficient knowledge receive a mention of fitness relative to the repair of mine-sweeping and mine-protection apparatus, which mention of fitness will hold good for three years. The award of this mention does not carry with it the cession of supplementary marks specified in article 19 of the present decision.

[1] In certain cases, it is impossible to arrange the American and French ratings as exact equivalents.

(4) As soon as the session is terminated these machinists or mechanics shall be sent back to their stations for duty.

ARTICLE 21.—(1) From an administrative point of view—

The officers undergoing the preliminary instruction are considered as absent from their station, on duty.

The warrant officers and machinists under preliminary instruction are subsisted on board the vessel permanently attached to the school.

Periodic Reports.

ARTICLE 23.—(1) At the close of each period of instruction, the permanent board will draw up a report on the operation of the mine sweeping school, accompanied, if necessary, by observations and suggestions which the results of the instruction have suggested to the board.

This report, annexed to that of the examining board, is drawn up in duplicate, one for the E. M. G., 5 (etat-major general, 5) and one for the direction of the military personnel of the fleet.

It is transmitted to the minister together with the opinions of the prefect maritime of the second arrondissement.

2. As soon as the list of warrant officers under preliminary instruction (en stage) who have obtained the certificate is decided, and without waiting for the report considered under paragraph 1 to be drawn up, the president of the board will address to the prefect maritime a list of the names of those warrant officers destined for the direction of the naval personnel of the fleet, mentioning the number of additional marks received by the graduating students. These marks are sent by the president of the board to the authorities under whom the interested parties are serving as a recommendatory note to accompany their pay accounts.

BUFFERS FOR GUN-SIGHT TELESCOPE AND WIND PROTECTORS.

Source: Reliable.

4 December 1919.

(12492)

This particular form of goggles, etc., was invented in connection with aviation material.

The essential feature of this invention lies in the use of a rubber sponge of considerable thickness, molded so as to fit the face and cover the eyes. This sponge is about 1 inch thick in some places and is very cleverly molded to fit over the nose and to make a good tight joint all around to keep out wind, light, and gases.

The use of sponge rubber in this connection is not new. The type of gas mask finally developed for the A. E. F. was a similar application of the same material. Sponge rubber is very light. There is a method of treating the external surfaces so that a sort of skin is formed on them and so that the material is not porous by being perforated by holes leading into it. The action of molding appears to be such that the bubbles in the sponge are confined very largely to the inside, so that even without a sort of skin treatment the material does very well.

What is called a W. P. B. S., or wind protector binocular support, was seen. These supports carry all ordinary binoculars by means of an ingenious head harness so that the observer does not need to touch his hands to them. They have been tested in tanks with much vibration, in the air, and on board ship. For a turret officer they would be somewhat awkward in crawling around a turret, but the glasses can be taken out if desired. The principal application of them for gunnery purposes appears to be on board destroyers looking for periscopes or aircraft or for navigational marks. They have a very practical feeling when worn and have had good reports when tested. They appear to be probably the most practicable form of hand spotting glass for use on destroyers which would be lively in a seaway and where the spotting officer would have his hands full. Another application of the same idea was to use the sponge rubber piece so that it covered both eyes and so that it would form the rubber on the piece for a gun-sight telescope. The device for this purpose is so made that the gun pointer could use one eye and then by a sideways movement of the head carry the piece over so that the other eye could be used. In the British Navy gun-sight telescopes have symmetrical eyepieces; that is, they are perfectly round and are not shaped so that they fit one eye or the other, or so that they can be reversed, as in the case of our eyepieces, to allow the pointer to use one eye or the other. It is believed that the desirability of shifting from one eyepiece to the other rapidly while firing is somewhat exaggerated. It should be remembered, however, that many gunnery officers have advocated both eyes being fitted, so that the eye not used would not have to be screwed up. A familiar device is to put one eye in the gun-sight telescope and the other in the old open sight and to close up the open eye by putting a piece of waste in it.

It is not believed that patents can be issued in the United States for the use of any particular material for a certain purpose. In other words, the use of sponge rubber for eye guards is not believed to be patentable. A pair of binocular supports were seen in the

Admiralty and one of the officers said that they were very good and that the use of sponge rubber in this way was a fine idea.

Upon considering the matter from the ordnance point of view, two suggestions are made:

(*a*) The wind-protector binocular support is considered excellent for hand-spotting glasses, particularly for destroyer use. When the sample is procured for aviation tests it should be arranged so that it may be likewise tried on destroyers.

(*b*) The use of sponge rubber for eye guards is evidently the coming style. It could be used extensively for the eyepieces on range finders. We have something like this on range finders now, but the finished article is considered to be by no means as good as it would be if the soft sponge were used.

In gun-sight telescopes, directorscopes, spotting glasses, and, in fact, in every optical instrument on shipboard, there is need of an eyepiece of some sort. At present it is hard rubber. It is considered that a molded sponge rubber piece would be very much better. Even if one eye is used, a double eyepiece of sponge rubber to comfortably cover both sides of the face is undoubtedly better. We used to have simply round openings for voice tubes but now we have the openings shaped to fit the face. Similarly, by shaping, we could very much improve on the guards on optical instruments. Sponge rubber is not a patentable feature, but from this and other very successful applications of it, it is thought to be the material of the future, particularly when the fitting is made large and well shaped. The softness allows a considerable amount of accommodation.

Practically everyone who has seen the devices is enthusiastic about this use of sponge rubber material. Most of the arguments, however, have been about the binocular support and other points of the details of the invention. Looking at it in a broad sense, however, it is considered that the most helpful thing learned from all of the examination is the suggestion to use sponge rubber liberally in future for all eye guards.

MISCELLANEOUS.

NAVAL ESTIMATES FOR THE YEAR 1919–20, GREAT BRITAIN.

Source: Reliable.

Statement of the total estimated expenditure for the naval service, including amounts provided in the civil service and other estimates:

	1919–20.	1914–15.
NAVY ESTIMATES.		
Estimated expenditures (after deducting appropriations in aid)	£157,528,000	£51,550,000
CIVIL SERVICE ESTIMATES.[1]		
Estimated expenditures under—		
Class I, vote 10.—Public Buildings, Great Britain—		
Maintenance and repairs, including new works, alterations, etc. £36,240		
Rents, insurance, tithes, etc. 20,000		
Fuel, light, water, etc. 30,000		
Furniture 12,700	108,940	28,375
Class I, vote 11.—Surveys of the United Kingdom [2]	....	5,490
Class I, vote 14.—Rates on Government property	210,000	156,000
Class I, vote 15.—Public works and buildings	.....	.....
Ireland; coast guard, viz:		
Purchase of sites	.....	.....
New works and alterations, including Naval Reserve stations	.....	.....
Maintenance and supplies 7,115		
Naval reserve, viz:		
Maintenance and supplies	7,115	7,802
Class II, vote 8.—Board of Trade.—		
Staff and incidental expenses in connection with the Royal Naval Reserve Force	6,960	3,042
Class II, vote 9.—Mercantile marine services.—		
Staff and incidental expenses in connection with the Royal Naval Reserve Force	4,000	2,500
Class II, vote 13.—Government chemist:		
Analysis of food, etc.	7,500	2,350

[1] Provision is also made in the estimate for Osborne (Class I, vote 2) for expenditure in connection with the treatment of invalid officers of the Navy in the Convalescent Home at Osborn, and in the vote for public buildings, Great Britain (Class I, vote 10) for annuities in repayment of sums advanced for sites and buildings under various acts.

[2] Provision for this service is now made in the Navy estimates under vote 6, subhead F.

	1919–20.	1914–15.
CIVIL SERVICE ESTIMATES—continued.		
Class II, vote 15.—Exchequer and audit department (cost of audit)—		
Navy cash accounts..... £12,502		
Expense and manufacturing accounts... 1,373		
Store accounts..... 4,094	17,969	12,941
Class II, vote 24.—Stationery and printing.....	550,000	120,000
Class III, vote 1.—Law charges, England.....	29,267	13,816
MAINTENANCE OF NAVAL PRISONERS.		
Class III, vote 8.—Prisons, England and the colonies....	6,937	790
Class III, vote 11.—Law charges and courts of law, Scotland.....	.....	50
Class III, vote 14.—Prisons, Scotland.....	2,500	200
Class III, vote 15.—Law charges and criminal prosecutions, Ireland.....	50	15
Class III, vote 21.—Prisons, Ireland.....	746	385
Class IV, vote 9.—National physical laboratory	6,500	.....
REVENUE DEPARTMENT ESTIMATES.		
Vote I.—Customs and excise—Percentage for provision of funds for district paymasters of the coast guard, etc.	500	360
Vote I.—Customs and excise—Staff and incidental expenses in connection with the Royal Naval Reserve Force.....	3,300	3,300
Vote 3.—Post office.....	[3] 442,000	46,660
Total.....	158,932,544	51,954,076

[3] This is an approximate figure only.

NOTE.—In addition to the services shown above, an annuity of £16,243/18 is payable to the commissioners of woods, etc., from the conoslidated fund, under the public offices sites act of 1882 (45 and 46 Vict., c. 32).

The subjoined statement of the estimated numbers of officers, seamen, and boys, coast guard, and royal marines, borne on the books of His Majesty's ships and at the Royal Marine Divisions, is included with the votes for information only, the House of Commons having already agreed on the 14th day of March, 1919, "that 280,000 officers, seamen, and boys, coast guard, and Royal Marines be employed for the sea and coast guard services borne on the books of His Majesty's ships and at the Royal Marine Divisions for the year ending on the 31st day of March, 1920."

I. SEA SERVICE.

Ranks, etc.—Under which vote provided.	Numbers, all ranks. 1919–20	1914–15
FOR HIS MAJESTY'S FLEET.		
Vote 1.		
Flag officers	16, 411	29
Commissioned officers	.....	5, 304
Subordinate officers	702	802
Warrant officers	5, 839	2, 082
Petty officers and seamen	196, 636	104, 487
Boys (service)	6, 638	5, 374
	226, 226	118, 078
COAST GUARD.		
Commissioned officers	80	101
Chief officers, etc	307	192
Petty officers and seamen	2, 140	2, 837
	2, 527	3, 130
ROYAL MARINES.		
(For service afloat and on shore.)		
Commissioned officers	953	428
Warrant officers	110	85
Staff sergeants and sergeants	.....	1, 353
Band ranks, buglers, and musicians	36, 833	1, 801
Rank and file	.....	14, 691
Band boys	.....	227
	37, 896	18, 585
Total	266, 649	139, 793

II. OTHER SERVICES.

Vote 1.		
Naval cadets	890	914
Pensioners in home ships, etc	[1]	298
Recruiting officers and ratings	191	[2] 67
Boys under training:		
Seamen class	4, 294	7, 155
Artificer class	923	720
	6, 298	9, 154
Other votes.		
For various services	2, 053	2, 053
Total	8, 351	11, 207

GRAND TOTAL.

Sea services	266, 649	139, 793
Other services	8, 351	11, 207
	275, 000	151, 000

[1] Included under Section I. [2] In addition to 123 marines included under Section I.

NOTE.—The number voted in March, viz, 280,000, was the number estimated to be borne on the 1st April, 1919, but the number actually borne was approximately 275,000, only as shown above. This number has since been largely reduced by demobilization and by ordinary wastage and will continue to be reduced as rapidly as circumstances permit until the number required for the post-war fleet is reached.

JAPAN'S NAVAL BUILDING PROGRAM.

Source: Translation from "Jiji Shimpo."

9 November 1919.

(7206B)

The rough naval estimates for the next fiscal year have already been reported. On account of the estimates submitted by the navy department for completing an 8-and-8 fleet, the present aims of the navy, and those for building shore works necessary for carrying out the building program, having been largely curtailed by the treasury department, the navy has to revise the building program with the sum for which it obtained the consent of the treasury. Now, the sum available for building purpose—that is, the sum remaining unspent from the appropriation authorized for completing the existing building program—is yen 408,761,571, and the sum newly requisitioned is yen 800,000,000, a total of yen 1,208,761,571. With this sum the navy is to build in eight years, from 1920–21 to 1927–28, the following ships:

4 battleships.	4 battle cruisers.
12 cruisers.	32 destroyers.
28 submarines.	18 special-service vessels.
5 gunboats.	

The above are the numbers of various classes of vessels to be built, with estimates curtailed by the treasury department, as decided at present, but the members of various classes of auxiliary vessels may be altered, although the sum allowed for building is unchangeable.

With the yen 8,000,000 requisitioned for the next fiscal year, the navy is going to lay down five gunboats and a number of other auxiliary vessels, leaving battleships and battle cruisers to later years, as the building yards are occupied at present. However, by 1923 all the vessels building under the existing program will be completed, and the shore works will be greatly improved, thus enlarging the building capacities, and heavier ships will be laid down from 1922. It takes about four years to complete a battleship, and in order to complete an 8-and-8 fleet by 1927–28 all the eight ships must be laid down by 1924–25. Now, there are only four yards in Japan which can build battleships—that is, the two Government yards, Yokosuka and Kure, and two private yards, Mitsubishi and Kawasaki—and the building capacity at present is a little over two battleships a year. In order, therefore, to complete the proposed fleet by 1927–28, the building capacity must be enlarged. For this purpose the sum available is yen 24,023,659, remaining from the appropriation already authorized, and yen 160,000,000, newly requisitioned; total of yen 186,000,000 in round numbers.

The building program first submitted by the Navy for the purpose of obtaining a complete 8-and-8 fleet included the building of the following auxiliary vessels:

30 Cruisers.
82 Destroyers.
75 Submarines.
30 Special service vessels.

But the estimates having been curtailed, the Navy has decided to build the number of auxiliary vessels as first stated. The number of auxiliary vessels to be attached to an 8-and-8 fleet is as follows:

(1) Thirty-two cruisers—16 organized into four divisions, 8 flag ships for torpedo divisions (4 for first line and 4 for second line), and 8 flagships for submarine divisions.

(2) Ninety-six destroyers—4 torpedo divisions of 16 destroyers each, and 32 destroyers for second line.

(3) Ninety-six submarines—4 submarine divisions of 16 vessels each, and 32 submarines for second line.

(4) Fifty special service vessels.

The ages of battleships, battle cruisers, and cruisers are divided into three periods, so that if the first line is kept filled up the second and third lines will be gradually filled. But the age of destroyers and submarines is divided into two periods, and after 16 years they are dismantled. The third line is therefore filled half with vessels of second period and half with vessels which attained the retiring age but are considered serviceable for coast defense, and the second line filled half with vessels of the first period and the other half with the vessels of second period. As to flagships for torpedo and submarine divisions, however, cruisers of the first period are to be used, both for first and second lines.

Hitherto converted merchant ships have generally been used for miscellaneous services. But then in case of emergency merchant vessels on various traffic lines must be withdrawn. Besides, some of the miscellaneous vessels, such as mother ships of hydroplanes, must have speed and special kinds of armament, and as a mother ship of submarines we can not satisfy ourselves with the *Karasaki*, as submarines are becoming larger and larger. Thus it has become necessary to have a large number of such vessels adapted for naval purposes.

As has been said, the number of auxiliary ships to be built has been reduced almost to one-half of the number first proposed by the navy. This, of course, does not mean that the navy has abandoned the proposition of building the required number, but it has been postponed. These smaller vessels can be built in a short time. In 1920, or 1922, when the navy has to make the program of replenishing the

first line, it will submit as an additional estimate the sum necessary to build the required number of auxiliary vessels.

For the enlargement of shore works the navy submitted an estimate of ¥240,000,000, which was cut off to two-thirds. The idea of the navy was (1) to extend building slips at Yokosuka and Kure, (2) to enlarge the iron works at Kure, (3) to enlarge the Kure Arsenal and engine works, (4) to construct new building slips at Sasebo, (5) to establish a submarine school, (6) to increase the equipment of various schools, etc. These are all necessary for building an 8-and-8 fleet and maintaining it. But on account of the curtailment of the estimates some of them can not be started in the next fiscal year, but expenses for them will be asked in later years.

With the establishment of an 8-and-8 fleet the increase of reserve munitions of war has become necessary. The navy has requisitioned for this purpose, it is said, several million yen to be expended after the fiscal year 1920–21. The reason for this increase is that as a result of increase of ships and from lessons learned in the last war, it has become necessary to have large amounts of reserve fuel oil, coal, various kinds of arms and ammunition. (The navy had requisitioned about 40,000,000 last year, which had been very much curtailed by the treasury department.) Especially, the increase of arms is significant, as it may be considered as a premise of realizing the idea of the navy of enlarging the defense divisions, placing them each under command of a flag officer, intrusting them with coast defense, and attaching aviation divisions to them, etc. This enlargement of defense divisions has been cut down by the treasury department, and thus there will be no changes in regulations relating to defense divisions in 1920–21, but the navy will at least build antiaircraft guns, torpedo nets, and other kinds of arms. At present there are two aviation divisions, one at Yokosuka and the other at Sasebo. The sum already authorized to equip these aviation divisions and available is 4,028,847, and the navy has requisitioned an additional sum to enlarge the Sasebo aviation division, but part of this sum may be used to start another division at Kure.

JAPANESE BATTLESHIP "NAGATO."

Source: Reliable.

4 December 1919.

(6797)

This latest addition to the Japanese Navy was christened and floated out of the building dock at the Kure naval station on November 9, 1919.

Her armament consists of eight 16-inch guns, twenty-two 5.7-inch guns, and eight antiaircraft guns. Also four underwater torpedo tubes, broadside, well aft. Her complement is 1,336.

Her turrets are about 15 inches thick, armor belt 13 inches thick, and turret roofs 5 inches thick.

The displacement is 33,800 tons, length 660 feet, beam 95 feet, and draft 30 feet. She is the largest and most powerful fighting ship ever built in Japan. Her speed is to be 23 knots.

There are 21 boilers, 15 to burn oil only and 6 to burn coal and oil (oil sprinkled on the coal fires when high speed is required).

The building of this ship was commenced on August 28, 1917, at the naval dockyard at Kure, and it is expected that all the work of completely arming and equipping will be finished by March, 1920.

The delay in her construction is ascribed to shortage of materials due to the World War, labor troubles, and changes in her plan (to bring her absolutely up to date).

It was originally intended to arm her with 14-inch guns.

The Emperor was represented at the christening by Admiral Prince Higashi-Fushimi.

The dockyard is commanded by Vice Admiral Oguri; the naval station by Admiral Baron Kato.

Vice Admiral N. Nakano has been ordered to relieve Vice Admiral Oguri as commander of the dockyard.

JAPAN—NAVAL ACTIVITIES.

Source: Reliable.

4 December 1919.

(6799)

It is reported that gigantic arrangements are being made at Kure and the neighborhood to facilitate the building of warships, seaplanes, and other weapons of naval warfare.

During the last few days, Admiral Ide, director of naval affairs in the Navy Department, has been inspecting those arrangements, which are now progressing full blast. Admiral Ide refuses to make any statement regarding the naval work, but it is reported that it is designed principally to enable the naval dockyard to turn out big warships and seaplanes, in view of the lessons learned in the world war. The stocks on which the superdreadnaught *Nagato* has been built will be extended by about 200 feet, and the construction of the *Akagi*, 40,000 tons, will be commenced next spring. At the same time, an extensive tract of hilly ground in the neighborhood will be leveled down and included in the premises of the naval dock-

yard. Within its precincts a great new dockyard will be erected, so that ships of 50,000 or 60,000 tons can be built.

Operations are also reported proceeding rapidly at Hiro, near Kure, where a new naval arsenal and an aerodrome are to be established. It is said that the arsenal will be able to turn out from 150 to 200 airplanes a year. A new aviation school is also to be established.

JAPANESE NAVY—SUBMARINES.

Source: Translation from "Jiji."

19 November 1919.

(6452)

Our submarine force is very weak at present, consisting of only about 20 vessels. Of these, *No. 14* was sold to France during the war, and of the remainder one-half are obsolete vessels not fit for actual service. Now there are about 7 submarines building, and these, together with those authorized but not yet laid down, are, it seems, with those to be built under the proposed building scheme, barely enough to form a force of submarines to be assigned to a fleet of 8-and-8 ships.

As to crews of submarines, they are at present being trained in three special service vessels, *Nagaura Maru* (former *Tatsuta Maru*) at Yokosuka and *Karasaki* and *Komabashi* at Kure, and also by defense divisions of those ports; and these special service vessels are taking in twice their complements. On account of the lack of funds, the navy has as yet had no submarine school, and the *Itsukushima* at Kure is now being used for the purpose. The next year's budget, too, will not allow the navy to establish one, but establishments for training crews for special branches will be gradually completed. Further, the navy will endeavor to build submarines from the next year, and they will probably be built, besides navy yards, at Mitsubishi at Kobe, Kawasaki, and Uraga Dockyards.

Sub Chasers.

(12483)

Trial of a submarine chaser built at the Sumidagawa Iron Works, to navy specifications was held this day, November 1, off Shibaura. The boat will receive its name or number when delivered to the navy. The engines of the boat are of Japanese make and were built by the Ikegai Iron Works to order of the navy. The boat is of the Tsukasa type, patented by Mr. Takahashi, president of the company. It is light and will not roll, even when running at full speed, and there is no danger of capsizing. It is said that the weight is 10.6 tons, length 50 feet, beam 10 feet, draft 5 feet, and the cost of construction ¥45,000.

While similar boats built at navy yards with foreign built engines develop only 27 knots this boat, with Japanese engines developed 34 knots, the same speed as those of the British boats of the same class. There is no chance of escape for submarines having a speed of 13 knots submerged and 18 knots afloat when attacked by this kind of chaser. In appearance it looks like a motor boat, and when it was running at its full speed of 34 knots to-day, it gave almost no sign of rolling. Navy officers present expressed their satisfaction.

IRON INDUSTRY IN JAPAN.

Source: Reliable.

4 December 1919.

(5933)

The iron industry in Japan made steady development during the war. In 1913, just before the war, the volume of pig iron produced in Japan totaled 240,000 tons and steel 250,000 tons. But pig iron to be turned out in Japan during 1919 and 1920 is expected to amount to 1,200,000 tons, i. e., 900,000 tons from Japan proper, 80,000 tons from Korea, and 240,000 tons from Manchuria. It is also expected that pig iron and steel to be demanded during 1920 will reach 430,000 tons and 1,300,000 tons, respectively, but iron foundries in Japan are now able to meet all the demands excepting special kinds of steel and iron. Particulars of iron foundries in Japan and their capacity are as follows:

	Tons.
Government iron foundry (Yawata)	400,000
Hokkaido (Wanishi)	150,000
Toyo (tobata)	150,000
Tanaka Kozan (Kamaishi)	120,000
Nippon Sentetsu (Kokura)	10,000
Nippon Seitetsu (Kurosaki)	15,000
Tokyo Sentetsu	10,000
Sanyo Seitetsu (Otake)	8,000
Senjin Seitetsu	10,000
Mitsubishi (Kyomipo, Korea)	80,000
Pen-hsi-hu (Manchuria)	60,000
Anshanchan (Manchuria)	180,000
Others	27,000
	1,220,000

JAPAN'S MERCHANT MARINE.

Source: Reliable.

4 December 1919.

(7410B)

According to reports so far available, the Nippon Yusen Kaisha will build, in addition to the 10 ships under construction, 69 new

ships aggregating a tonnage of 515,000 during the next five years. Of these 36 vessels aggregating 382,000 tons are for overseas services, 6 being first-class passenger ships for the trans-Pacific and European services. This will give the company a total fleet of 153 vessels, with an aggregate tonnage of 1,114,793.

The Osaka Shosen Kaisha has also decided to build five freight and passenger combination steamers of 3,500 tons each, to be placed on the coasting services in northern China.

JAPAN—COLONIZATION OFFICE.

Source: Reliable.

4 December 1919.

(12485)

The Japanese Government has decided to establish a new colonization office during 1920 for the administration of the colonies. The expense is estimated at about 700,000 yen, distributed as follows:

For government general of Chosen	¥200,000
For government general of Formosa	200,000
Canton office	150,000
Kabafuto office	50,000
Colonization office	100,000

This office was formerly a bureau in the department of the interior, and due to increased duties it was found necessary to enlarge it and form a separate office of it. It is still, however, to be under the home minister.

JAPANESE NOTES—ORDER FOR STEEL.

Source: Reliable.

4 December 1919.

(7010)

The Asano Co. has just placed an order in the United States for 465,000 tons of steel. The delivery is to be covered by a 10-year contract, calling for 45,000 tons each year.

The yearly delivery is to be divided as follows:

12,000 tons of shapes.
3,000 tons of bars.
30,000 tons of sheets.

JAPANESE SUBMARINE NET.

Source: Reliable.

4 December 1919.

(12494)

Since the opening of the war the Japanese Navy has been studying a new torpedo defense net. It is similar to that used by the allied nations during the European War.

The Navy asked for funds in this year's budget for its construction during peace times as preparation against another war.

The cabinet council recognized the necessity for it and it was allowed as coming under the head of "expenditure for arms preparation."

( )

OFFICE OF NAVAL INTELLIGENCE.
NAVY DEPARTMENT.
Washington, D. C.

MONTHLY INFORMATION BULLETIN.

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15 FEBRUARY, 1920.

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NUMBER 2—1920—15 February, 1920.

FOR CONVENIENCE IN ROUTING.

Officer.	Initials.	Date received.	Date forwarded.
Captain			
Executive Officer			
First Lieutenant			
Navigating Officer			
Gunnery Officer			
Communication Officer			
Engineer Officer			
Medical Officer			
Supply Officer			
First Division Officer			
Second Division Officer			
Third Division Officer			
Fourth Division Officer			
Fifth Division Officer			
Marine Officer			

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INTERNATIONAL.

ECONOMIC CONDITIONS IN FOREIGN COUNTRIES.

Source: Reliable.

3 January, 1920.

UNITED KINGDOM.

Foreign Trade.

Declared exports from the United Kingdom to the United States in 1919 aggregated $359,671,231, exclusive of the Birmingham consular district and the West Hartlepool agency, from which no returns have been received. The total in 1918 for the whole United Kingdom was $143,272,830, and in 1913 about $290,000,000.

The gross tonnage of American vessels entering the port of London in 1919 was 1,003,258 as compared with 134,823 in 1918.

Roumania has been added to the list of countries to which the British Government export credit plan involving the sum of £26,000,000 applies.

Restriction of Imports.

In accordance with the recent decision of Justice Sankey, the British Government, pending an appeal, is permitting the importation of all articles formerly prohibited.

This decision, if sustained, may bring in its train considerable litigation between British and American firms whose contracts were automatically cancelled by the prohibitory orders. It will tend however, to give confidence and strength to the anti-Protectionist element in British politics.

Parliament, of course, has the power to enact a law imposing any kind of restrictions or prohibitions on imports; and the imports and exports regulation bill now pending in Parliament is designed to accomplish by law what had been previously done by executive order. Nevertheless. this bill is meeting with so much opposition that it is already looked upon by many as practically dead.

Coal.

The Government is now engaged in discussing with the coal owners the question of distributing fairly and equitably the profits of the industry. The coal industry emergency bill, limiting the profits of the coal owners, is being debated in Parliament.

A bill to give effect to the readjustment of prices will be introduced when Parliament reassembles on February 10. Demonstrations and propaganda in support of the movement for nationalization of the mines are being conducted on a large scale to compel the Government to change its policy. The special Trade Union Congress, held in London December 9, decided to postpone action on the nationalization issue until after Parliament reassembles in February. If at that time the Government has not given way another coal crisis may occur.

Labor.

The strike of the iron molders continues, with no prospect of a settlement.

CANADA.

Tariff Question.

The minister of finance recently announced that no revision of the tariff will be undertaken at this time on account of the magnitude of the problem and the present abnormal state of economic conditions.

The board of commerce has announced that it intends to investigate the tariff situation and its connection with the high cost of living.

SOUTH AFRICA.

Stoppage of Exports of Foodstuffs.

The executive committee of the Federation of Trades on 17 December called upon the affiliated unions to refuse to handle foodstuffs for exportation from South Africa; and it appears that this order has been generally followed.

AUSTRALIA.

Proposed Development of Paper Manufacture.

The premier of New South Wales recently announced that the State government had been carrying on a series of experiments to ascertain whether paper could be manufactured in Australia. The results of these experiments have been favorable and the government has taken steps to arrange for the establishment of a plant in New South Wales.

The Exchange Situation.

The pound has depreciated in Australia in almost the same degree as the imperial pound in Great Britain. This situation is very seriously endangering American export trade in Australia. It appears that this depreciation of the pound has tended to increase the anti-American feeling in certain quarters which has already been aroused by the belief that the Webb-Pomerene act was intended to assist

American trusts in their efforts to dominate Australian industrial life.

FRANCE.

Foreign Trade and Exchange.

Statistics of foreign trade for the first 10 months of 1919 indicate that exports from France have not yet begun to increase appreciably. French imports for the first 10 months of the past year totaled 23,000,000,000 francs, while exports aggregated only 5,500,000,000 francs. The totals for the corresponding period in 1918 were 18,000,000,000 and 4,000,000,000 francs, respectively.

Thus the fundamental factors causing a depreciation of the franc have not changed materially. Optimism, however, is manifest as it is hoped that the prospective British loan and the passage of the Edge bill may better the financial situation. Clemenceau announced in the Chamber of Deputies that although no understanding with Great Britain regarding the loan had yet been reached, the prospects for an understanding were excellent.

It is reported that the premium on the dollar in France has caused a tendency to purchase in Germany rather than in the United States. It is stated that the comptoir central d'achats industriels pour les regions liberees, the central purchasing office of the French Government, for the destitute regions, has placed large orders with German firms for machinery and other manufactured goods. It is further reported that representatives of this organization have been sent to Germany to ascertain what products may advantageously be imported into France.

Finances.

Although no fundamental measures to improve the situation of the treasury have yet been taken, it is being more clearly realized that more drastic taxes must be imposed. In a recent address M. Klotz, minister of finance, stated that the revenue from taxes during the past year was over 11,000,000,000 francs as compared with 5,000,000,000 in the year before the war. M. Klotz stated that it was still necessary to increase this form of revenue at least 50 per cent.

Reports indicate that the income tax, which was introduced for the first time during the war, is not effectively enforced, due largely to the unwillingness of French taxpayers to bear the burden of direct taxation.

M. Klotz has asked for 13,000,000,000 francs for the first quarter of 1920.

Proposed Petroleum Monopoly.

The decree of 4 December, which instituted governmental control of the importation into France and Algeria of mineral oils and their

derivatives, is viewed as a step in the direction of the establishment of a fiscal monopoly of the importation and distribution of these products.

Shipping.

Considerable dissatisfaction with the proposed allotment of the German ships has been manifested. It is contended that the proposed arrangement penalizes France because during the war the whole industrial effort was directed to the production of munitions rather than the building of ships. It is claimed that France would thus receive only 250,000 tons of German ships, the war loss having been 900,000 tons, while other countries such as the United States and Brazil would receive far more tonnage than they lost during the war.

Coal Situation.

It is reported that the cabinet has approved a plan for turning ahead the clocks one hour in order to save fuel, this measure to be instituted the 1st of February. Further, restrictions upon lighting have been instituted and even a project for total suppression of passenger traffic upon the railroads has been discussed.

Considerable public dissatisfaction with the policy of the Government has been manifested, and the ministers of industrial reconstruction and of transportation are blaming each other for the difficulties. A conference of ministers to discuss the coal crisis was held on 21 December, and a more energetic policy is anticipated.

Railroads.

On 23 December the cabinet approved a bill for temporary increase in the railroad rates averaging 50 per cent on passenger tickets and 115 per cent on freight traffic.

BELGIUM.

Iron and Steel Situation.

Conditions in the iron and steel trade are if anything increasingly difficult, the blast furnaces and rolling mills complaining bitterly of the lack of materials to work upon. A fresh cause of disturbance is found in the fact that the Luxemburg Government has prohibited the export of ores, pig iron, and half-finished materials to Belgium, owing to dissatisfaction with the supplies of coke and basic slag which Belgium has been supplying to Luxemburg. Buyers are clamoring for materials of all kinds apparently regardless of price, and it is wholly impossible to supply anything more than a fraction of the demands.

Prices have an upward tendency, the scarcity of every description of finished material becoming more pronounced from week to week.

Lack of fuel is the fundamental trouble, but the railway system is so congested that even if the supplies of coke were more ample the demands of the steel works could not be met.

On 1 October there were 10 blast furnaces in operation and 46 idle, against 3 furnaces in operation and 53 idle on 1 July 1919, and 48 furnaces active and 11 idle on 1 July, 1914.

Railway Situation.

Although the situation is improving, there is still a shortage of rolling stock. It is reported that large purchases of freight cars have been made in Great Britain: 375 locomotives have been ordered in the United States, 125 in England, and 175 in Belgium.

At the time of the armistice 932 miles of railway had been destroyed, but now most of this has been replaced. The fact that many bridges had been destroyed impeded this work, but at least temporary replacements have now been made.

Present State of Belgian Industry.

The first three quarters of 1919 have seen a steady development in Belgium's crippled industries. As a result, the last months of the year find a number of the industries fast approaching prewar production and the promise for the future brighter than most people dared hope for a year ago.

Figures prepared by the "office central d'information" under the minister des affaires economiques show the present output of Belgium's principal industries as compared with 1913 production figures. Present production expressed in percentages is as follows:

	Per cent.		Per cent.
Coal mines	98	Sugar	100
Sand glass	50	Glass	66
Chemical products	25	Mirrors	33
Superphosphates	50	Textiles	60
Matches	50	Leather products	50

Despite the fact that the production of coal is so nearly normal it is lack of coal that is the greatest obstacle in the way of increased production in Belgian industry as a whole. The complaint is universal and there is much criticism of the Government for allowing the exportation of the large quantities of coal that are going out of the country.

SPAIN.

Labor Troubles.

Although still somewhat below normal, the street railway service in Madrid has improved. The companies refuse to treat with the strikers. The lockout in Madrid has extended to the metal workers and locksmiths. The gas, electric, and telephone employees have abandoned their proposed sympathetic strike.

There is apparently no improvement in the situation at Barcelona and the employers continue to maintain a firm attitude. Continued labor disputes are reported in other parts of the country.

Financial.

It is reported that the limit of note issue permitted to the Bank of Spain is about to be increased from 4,000,000,000 to 4,500,000,000 pesetas. Although the bank has expanded its circulation rapidly in the past year, the total increase in notes outstanding since July, 1914, is less than 1 per cent in excess of the amount of gold added to the reserves of the bank.

PORTUGAL.

Financial.

It is rumored that the Government contemplates making a large internal loan for the construction of new railways and that it is about to take over the principal railway company's lines.

The ministers of finance, colonies, and agriculture are resigning. The resignation of the first is of importance as showing the difficulty of the financial situation. Great difficulty is foreseen in obtaining a competent financier to succeed him as several politicians have wisely declined to serve.

ITALY.

Fairs.

The participation of the United States has been requested in the International Art Exhibition of the City of Venice, which is to open the middle of next April and continue for six months.

A sample fair will be held at Milan in March, which will follow the Lyons and Leipzig models, and is being financed by four large Italian banks.

Tourist Travel.

A commission has been organized composed of former government officials acting in conjunction with the National Hotel Association and the Touring Club of Italy for the purpose of encouraging a resumption of tourist travel.

Trade.

It is reported that American manufacturers are contemplating the erection of silk mills in Italy, negotiations having already begun between certain American manufacturers and the Italian Government for the construction of large silk factories in the north of Italy.

There is a great scarcity in Italy of leather for shoe uppers especially for women's fine shoes. There is also an urgent demand for raw and tanned hides; sole leather on the other hand exists in sufficient quantities.

Transportation.

The train service with Jugo-Slavia, which was authorized, can not be resumed for lack of coal.

Italian and Austrian business men are reported to have arranged a meeting for the middle of January to establish regular traffic and commercial relations between the two countries.

Italian and Jugo-Slav delegates have reached an agreement concerning postal facilities, telegraphs, and commerce.

Finance.

Italy's plans for raising needed funds have undergone another change. The original idea of a 2 per cent compulsory loan was given up in favor of a 3½ per cent loan carrying with it exemption from the proposed tax on capital. This in turn has been abandoned in favor of a 5 per cent loan issued at 87.5 but this proposal is accompanied by drastic increases of taxation. The Government measures include the following: (1) A progressive tax on the increase of capital due to war profits; (2) an extraordinary progressive tax on capital from 20,000 lire upwards, ranging from 5 per cent to 25 per cent, spread in annual payments over 30 years and applicable also to foreigners; (3) a revision of the present tax on incomes by the institution of a progressive income tax varying from 1 to 25 per cent on all incomes over 1.500 lire with allowances for children; (4) an increase of the special tax on bearer bonds; (5) an increase of the various existing taxes on bicycles and motors; (6) a tax on the sale of all articles except food and fuels; (7) a special tax on the sale of luxuries at the rate of 10 per cent; (8) a duty on brewing; (9) a further large increase in the rate of railway fares already twice raised since the war began and in the charges on baggage; and (10) a reduction of the interest on treasury bonds by one-fourth per cent.

The Italian minister of finance in a recent report had estimated the deficit for the year ending 30 June 1920, at 2,600,000,000 lire (par value of the lira is 19.3 cents). The public debt of Italy is now given as 83,000,000,000 lire.

The Italian Government is attempting to meet the difficulties caused by the rise in exchange by requiring drafts payable in dollars to accompany shipping papers as a condition for the release of exports to the United States. In cases where American importers have already financed the manufacturing of Italian goods permission to export will be granted by the ministry of the treasury.

SWITZERLAND.

Prices.

The general level of prices on goods offered for sale in Switzerland by German manufacturers is reported to be 50 per cent below

the Swiss prices. As a result the closing of the Swiss frontier against German goods is being agitated.

Oil Trade.

Arrangements are being made between Switzerland and Roumania whereby large quantities of Roumanian mineral oils will be secured in return for Swiss products and the difficulties incident to the unfavorable rate of exchange will be avoided.

Sample Fair.

The Fourth Swiss Sample Fair will be held at Basel from 15 to 29 April. The chief object of the fair is to stimulate existing business relations, to create new connections, and to give the public a better idea of the extent and nature of home manufactures.

GERMANY.

Trade.

Under the provisions of the new economic treaty with Poland that country agrees to deliver to Germany 300,000 tons of potatoes at 16 marks per hundredweight (the pre-war value of the mark was 23.8 cents, but to-day it is slightly over 2 cents), 72,000 tons of petroleum or petroleum products, and 220,500 gallons of spirits. Other provisions of the treaty cover the opening up of trade and transit between the two countries and the grant by Germany to Poland of a certain number of cars and locomotives as well as coal and machinery.

Germany has bought 300,000,000 pounds of lard and meats from the United States within the past three months. Payment has been made of 25 per cent in cash at the time of purchase and 25 per cent each in 3, 6, and 9 months credit. The Germans are reported to be buying cotton and wool at almost any price.

German traders in Brazil and in Argentina are reported to be offering their goods at prices far below those asked for similar articles of American manufacture. The commodities for which orders are sought include such things as scissors, razors, embroidery, cottons, pins, writing paper, metal buttons, cotton stockings, small ribbons, and similar articles.

Shipping.

The present shipbuilding program of Germany provides for the production of 1,000,000 gross tons of shipping annually, of which 200,000 tons would go to the Allies as indemnity, leaving 800,000 tons for the building up of the German merchant marine. The ex-German passenger ships taken over by the United States during the war have been advertised for sale by the United States Shipping Board with the stipulation that the ships shall be run under the American flag.

Dyes.

Vat dye shipments to the United States are expected to start from the factories in Germany on 3 January and to be completed by 18 January. Five hundred tons are ready to be shipped at once. The German dye trust, consisting of three large and four minor concerns and capitalized at 1,500,000,000 marks, is planning to double its capital in order to regain German supremacy in the dye field.

Labor.

The National Bureau of Statistics in the December issue of the National Labor Gazette, declares that the labor situation is growing worse. The coal shortage, which compels frequent shutdowns of industry, has thrown many employees out of work and the situation has been further aggravated by the continual lack of raw material.

Export Regulations.

An order is expected to be issued shortly empowering the national economic minister to forbid the export of goods of every kind except by permission of the national commissary. Charges will be imposed upon export permits the proceeds from which will be devoted to improving social conditions. Penalties for illegal export have been greatly increased, involving confiscation, imprisonment and fines amounting to triple the value of the commodities. The prohibition on the export of foreign securities from Germany has been extended to 31 January.

Finance.

The bill for the federal emergency sacrifice tax on property was passed by the National Assembly on 17 December.

Subscriptions to the premium loan, by which it was hoped to secure 5,000,000,000 marks, amounted to only 3,800,000,000. It is now charged that 10,000,000 marks were spent for propaganda for this loan.

THE NETHERLANDS.

Electrification of Railroads.

The Dutch railroads intend to electrify the system between Rotterdam and The Hague, Amsterdam, and Amersfoort.

Relief Work.

The Netherlands Women's Organization for the Protection of Prisoners of War has expressed a desire to cooperate with similar organizations in other countries, especially with those in the United States, whether private or official. The aim of the organization is to offer relief to prisoners of war in Siberia.

AUSTRIA.

Trade.

The Austrian chancellor, Dr. Charles Renner, has announced that he will leave for Prague early in January to arrange for economic assistance for Czechoslovakia on long-time credit. He hopes to conclude an agreement for the interchange of industrial and eventually of agricultural products for at least 10 years.

Finance.

A request by Austria has been made in Paris for an advance of from $30,000,000 to $40,000,000 to be guaranteed by a rental of the Austrian tobacco monopoly.

CZECHOSLOVAKIA.

Trade.

The ministry of commerce of Czechoslovakia has just published a commercial statement for May and June, 1919. In these two months exports amounted to 552,000,000 crowns and imports 559,000,000 crowns (the prewar value of the crown was 20.3 cents). This is a closer approach to equilibrium than has been obtained by any other nation.

Forestry.

The Czechoslovak Republic has come into the ownership of the Hapsburg crown lands. These cover an enormous expanse, comprising about 12,000,000 acres, nearly all of which is forest land. To assist in the formulation of a policy for the care and exploitation of these forests a group of American experts has been summoned to Czechoslovakia.

ROUMANIA.

Credit Difficulties.

The American minister cables that it is useless to send agents to Roumania to transact business there unless they are empowered to sell their goods on from three to five years' credit. Moreover, the low exchange rate makes it difficult for Roumanian importers to buy our products.

American Purchases of Oil.

The Standard Oil Co. has recently purchased 500,000 barrels of refined petroleum from the Roumanian Government, paying therefor $3,150,000. The oil will be shipped to America in American bottoms.

GREECE.

General Conditions.

Trade Commissioner Mears mentions the need of extreme caution in exportation to the Balkans and the Levant. Large stocks of goods are still at Piraeus awaiting suitable markets, the most inviting market being Russia. Mr. Mears enumerates the difficulties in the way of American trade in the Near East as follows: (1) Export permits and prohibitions. (2) Dumping goods in Greece at prices below the New York level. (3) Exchange fluctuations. (4) Customhouse and warehouse lack of space and service.

Reports of this character have reached the Department more or less regularly during the last six months, but the sales to Greece and other countries in the region have apparently not diminished during this period.

Import Prohibition.

Greece has prohibited the importation of alcohol and distilled wines, except such as are bottled, until the end of 1920. Among the possible motives behind this enactment might be mentioned (1) the fear of wholesale dumping of American alcohol following the prohibition amendment, (2) the desire to protect the interests of the Greek wine and spirits companies, and (3) the desire to exclude certain qualities of nonpotable alcohol which have recently been sent to Greece from this country in large quantities.

TURKEY.

Shipping Service.

It is rumored that the National Steam Navigation Co. of Greece will begin a regular freight and passenger service from New York to Constantinople and other Near Eastern ports this month. It was reported some time ago that the Mallory Steamship Co., an American organization, might preempt this particular field of service.

British Automobile Company.

A concern capitalized at 500,000 pounds sterling is soon to open business, with headquarters at Constantinople, for the purpose of operating trucks, taxicabs, busses, etc.

Committee on Regulation of Trade.

Until recently our country was not represented on the committee for the regulation of trade in Bulgaria and Turkey. The facts that the American high commission is to be represented in the future, that the chairmanship of the committee is to be rotary, and that an American consul is to be secretary promise better protection of American interests in the future.

ARMENIA.

Trans-Caucasian Conference.

Following the commercial and arbitration treaty between Armenia, Georgia, and Azerbaijan, a conference is soon to be held at Tiflis for the settlement of financial and economic questions pending between the three republics.

PERSIA.

Anglo-Persian Treaty.

Pending the construction of railroads by British capital, as specified by the Anglo-Persian treaty, British companies are planning to institute immediately an important motor transport system for Persia.

SWEDEN.

Commercial Treaty.

According to the commercial treaty between Sweden and Germany in May, 1911, three months' notice of its expiration was to be given by either side. Sweden gave notice of its expiration in the latter part of 1919. Since then, however, negotiations have been carried on during the autumn between the Swedish and German Governments regarding the prolongation of the treaty because it was found that no agreement could be reached concerning a new treaty at the present time. By an exchange of notes it was decided that the old treaty should remain in force until 31 March, 1920.

Electrification of Railroads.

The committee on hydroelectric power has requested the Government to purchase waterfalls in order to extend the electrification of the Swedish railroads. The Swedish Reichstag has appropriated 8,000,000 kroner for that purpose, but the commission suggested an addition to this amount of 2,000,000 kroner. By those purchases the commission feels that the present needs for water power for the railroads will be met temporarily.

NORWAY.

Exhibitions.

The Norwegian Housing and Town Planning Association, a national organization, announces that an exhibit will be held at Christiania from 19 April to 3 May, inclusive, of materials entering into the construction of houses for residential purposes including flooring, walls and ceiling materials, sanitary and heating apparatus of all kinds, electric installations for heating and domestic power purposes, roofing and tiling. A section will also be allotted to the exhibition of ready-made buildings.

Spitsbergen Coal.

Recently it was announced that the Norwegian coal fields at Spitsbergen had been sold to an English concern for £200,000. The Nor-

wegian Government had previously offered the Norwegian owners a loan of 250,000 kroner and had requested them not to sell their interest. But in view of the coal conditions of the country and the possibility of the establishment of labor councils, etc., it was considered that it would not pay to continue working the mines under the altered conditions, and therefore the sale was consummated.

Exchange.

The exchange on the American dollar fell during the last week of December to 4.88 kroner, compared with 5.05 earlier in the month, the normal exchange being 3.73.

FINLAND.

Enlargement of the Harbor of Helsingfors.

The Helsingfors city council has appointed a committee to prepare a plan for enlarging the harbor. The committee will begin its work immediately. According to plans the present 3,000 meters of quays is to be lengthened to 27,000 meters. The cost is estimated at about 109,000,000 Finnish marks. The project embraces a free harbor. The Helsingfors south harbor will be used for Baltic shipping and passenger traffic. The north harbor will accommodate the local traffic, while Sornas Harbor will be used for export trade, especially timber and lumber and their products. On the shore surrounding this harbor there is plenty of space for the buildings of industrial plants.

Finnish Exchange Commission.

The Finnish exchange commission announces the withdrawal of restrictions in the purchase of foreign money. The banks are not permitted to sell available foreign values without limit until further notice.

POLAND.

Freight Transit from Danzig to Poland.

Figures recently published show that from 9 February to 15 October 1919, 20,750 cars of merchandise have entered Poland via Danzig and Mlawa on the German frontier; this means an importation amounting in quantity to 561,579,000 pounds. The imports have been practically all confined to goods for Government purposes, food, and goods for relief. By far the greater part of the imports have been of American origin. There has been up to the present time very little exportation.

Polish Textile Industries.

A number of the more important cotton mills in Lodz, Poland, are reported to be again in operation, and six of the leading cotton manufacturers have formed a trust in order to derive the full benefit

from the sum allocated by the Government for the reestablishment of Polish industries. The importation of raw cotton appears also to be proceeding satisfactorily, shipments via Danzig being no longer subject to interference, though imports via Austria are liable to be held up pending the receipt of exchange commodities.

The wool industry is said to be resuming its activities and numerous companies are reported to be at work.

Exchange in Poland.

The exchange condition continues to be the chief obstacle to American importations in Poland. The rate has now reached 100 Polish marks to the dollar. All restrictions on the sale and purchase of foreign exchange in Poland have been withdrawn, and the control exchange bureau closed.

Economic Program of Premier Skulski.

Premier Skulski proclaimed in the Diet on 18 December the general program which the new Government considered necessary to establish the Polish democracy on a secure social and economic basis. His economic program dealt with the policy of protection necessary to Polish industries, the regulation of emigration, and the necessity for foreign assistance. His financial policy covered the need of a unified currency, the stimulation of exports, and the judicious regulation of imports which would call for the payment in goods rather than in cash; the cotton industry was especially favorably mentioned in this connection. The Premier indorsed an 8-hour day and a 46-hour week, which aroused the enthusiasm of the parties of the left.

Financial Difficulties of Poland.

It is reliably reported as the unanimous opinion of all American representatives in Poland that the situation arising from the lack of funds for the transportation of food and other supplies, is becoming very serious. It is useless to attempt any measures of relief without first granting funds for transportation since Poland can not supply them for this purpose, and it is reported that unless financial aid is forthcoming very soon the constructive efforts and accomplishments of the Government of Poland will be imperiled.

THE RUSSIAN PROBLEM.

18 December, 1919.

Source: Reliable.

The reason for Deniken's, Kolchak's, and Judenitsch's failure is to a certain extent the same. Their failure is not due to the soldier or officer but to the principles which have guided their domestic and foreign policy. The people of the new border States, as also those of

the regions liberated by the generals in question—even the poor farmers—have all turned politicians. They refuse to be led astray by pompous democratic phrases. They demand firm guarantees as to the future. Such they have failed to receive and as a consequence the advancing armies have had discontented conditions in their rear, when all their attention and strength should have been devoted to the enemy in front. The specter of despotism haunts the liberated peasants and many of the soldiers actually fighting in the White armies. If all fear of reactionary tendencies on the part of the leaders could be dispelled, the defeat of Bolshevism by external military forces might prove a possibility.

The character of the soviet armies has been rapidly changing. The soldiers are far better fighting men, and contain an increased proportion of communists, who have been drawn from the large cities. The soviets resent the term "Red armies," believing them now, in the true sense, national armies. Originally they were purely a class force, thereupon becoming a mixture of class and mercenaries, who joined owing to better food and clothing. Allied intervention and the blockade have been important weapons in the hands of the soviet leaders, who have in turn employed them most skillfully for the purposes of propaganda. The result has been that a patriotic wave has swept through soviet Russia, resulting in the present strong soviet army. Leaders have appealed, not only to class feeling, but to national ideals. Allied assistance and the campaigns of Kolchak, Deniken, and Judenitsch have thus helped to accomplish two things: (1) The brutal Bolshevik régime has been able to give way to more tolerant government with armies more national in character, and (2) the narrow class interests of many antisoviet forces within Russia have come to light and been discredited. Kolchak's true defeat lies in the animosity of the Siberian people rather than in the Bolshevik forces which have opposed him. The Petrograd population supported the soviet government wholeheartedly when Judenitsch advanced. The tyranny or stupidity of Denikin (as he advanced) equaled any described as exercised by the Bolsheviks.

There is plenty of food at present in Russia. Lack of communications, rolling stock, and confidence will be found to be the principal reason wherever food shortage exists. The great need is clothing. In Siberia and the Volga regions there is a superfluity of supplies in the country regions. Central Russia is not so well off. Northern Russia is starving. The cities lack food, partly from lack of cars with which to transport the wheat, but mostly because the peasants refuse to sell for the money received in return. The peasants themselves are far better off than they ever were before, far better fed, and possessing much they never previously dreamed of. Their longing is merely to *own land* outright,

so that it may be handed to their sons. The land question to-day is, despite all that has happened, just as difficult and unsolved a problem as ever. The Bolsheviks, despite their declaring all the land national property, have merely been able to nationalize it in certain sections, especially the central territory between Petrograd and Moscow. In others, the peasants, who seized the land after the landlords had fled or had been killed, held it, despite soviet government manifestos and threats. When the land was seized by the peasants the wealthy and influential among them obtained the largest and the best areas, while the less fortunate were merely able to seize and hold small holdings. Twelve million rifles are now in the hands of the peasants. With them they are determined to protect their land against either Bolshevik officials or reactionary soldiery. The peasants are well aware of the fact that they hold the land illegally, and have no proper title to it. This causes them uneasiness and dissatisfaction. Any power being able to guarantee and *convince* them—85 per cent of 150,000,000—that their titles will be legalized, will win in the great conflict. At present there is neither a fair nor general land distribution. The landowning class has simply changed in character by the disappearance of the old nobility. The peasants are to-day fighting, not to support or obey the government, but in the belief that only by fighting will they be able to retain their land from the opposing reactionary forces.

The thoughtful men in Russia feel that nothing does more to-day to keep alive Bolshevism than the blockade. The leaders find little difficulty in persuading the people, through press and propaganda, that by enforcing it, the Allies are the cause of all woes and evil. The blockade abandoned and supplies permitted to enter, the people would soon find out that the rottenness of the whole structure was at fault and that they had been listening to false prophets. By the raising of the blockade, the present nationalization and stagnation of many industries would probably also change. The impetus of foreign competition would, despite all tariff protection, force any soviet government to allow many industries gradually to evolve back into private enterprises. It is difficult to judge whether the nationalization of industries has proved an absolute failure, owing to the soviet system. The true test can only come when the blockade is raised, raw stuffs come in, and finished products go out, and competition may be entered into with the outside world's capitalistic system.

An influential Russian business man stated recently: It is possible that an understanding might be reached whereby the Allies might be able unofficially to send business men or commercial representatives to soviet Russia, in return for raising the blockade. On the one hand valuable concessions might be obtained in return for raw

stuffs, while on the other, an economic pressure will be done away with which has defeated its own object. Baltic business men, or other half-Russian representatives might in the beginning be employed as the intermediary. The commercial relations proposed would tend rather to counteract Bolshevism than play into the hands of the present soviet government.

The time is approaching for the new elections to the central soviet. The Bolsheviks are coming more and more to the conclusion that people can not be forced to become communists. A change in tactics toward the peasants is clearly noticeable. The old tactics are seen to be faulty. The Government is no longer forcing the issue of whether all the property belongs to the nation or some of it also to the individual. Strong Government control of all the property is now being emphasized.

The return of Bolshevism to the Baltic Provinces is a genuine and constant menace, not as previously, from outside, but from inside. Since the defeat of Bermondt, strenuous and constant attempts have been made by many German agents to break down the present Latvian Government by secret Bolshevistic agitation and propaganda. German-Russian arms having failed Bolshevik doctrine is to be attempted, ultimately to serve German commercial and militaristic aims. Large sums of money have been smuggled in to Bolshevik and communistic members and sympathizers.

The commandant of the present Lithuanian capital, Kowno, was discovered to be a former French and later German spy, now secretly working among the Bolsheviks, in German pay. Much harm has already been done. In Latvia two regiments were at the last moment found unsafe to send to the eastern (Bolshevik) front, and their marching orders were countermanded at the last moment. In Libau, matters were found so serious that Col. Du Parquet, the chief of the French military mission, stated he could not undertake the training of Latvian soldiers there, under French military instructors, unless the mayor of the city, and a large number of the recruits, were at once imprisoned.

The Latvian, as also the Esthonian Governments, both feel themselves too weak to dare to take the measures they know requisite, to alter the present state of affairs. In both cases the strong commanders in chief, Laidoner in Esthonia and Ballod in Latvia, have repeatedly urged upon their respective Governments to give them powers to take stern measures of repression. Their requests have not been granted, the Government fearing the effect upon the Social-Democrats who are, in both Provinces, largely in the majority. The Governments hope that the national spirit, which is unquestionably growing, owing to the recent military successes against Bermondt,

may counteract the growing Bolshevik undercurrents. I was informed by the officer in charge that when Litvinoff crossed the frontier from soviet Russia to Esthonia, it was for a moment very doubtful whether the Esthonian squad of soldiers drawn up at the station to keep the curious away, would not break into a cheer. The episode well illustrates the feeling among a large number of soldiers.

The Latvian Government has called attention, through the commander in chief, to the fact that the greatest element of Bolshevik danger lay in the insufficient rations now available for the troops, requesting, "for this reason," that the United States Government help by a loan of flour. This statement is believed to be correct.

Soviet Russia is to-day perfectly willing to acknowledge the independence of the Baltic States. This being known and widely propagandized makes it doubly difficult for Esthonia, Latvia, and Lithuania to withstand the popular demand for peace, and the cessation because of empty coffers of large military expenditures. Through fear not only of allied opinion but of the increased Bolshevik propaganda influence and commercial concessions (which would immediately result if peace were established), the Governments of the Baltic Provinces are desperately trying to save themselves and their countries by half measures, such as proposing an armistice instead of peace, a temporary neutral zone in place of open frontiers, etc.

The following interview with Mr. Karl Opitz is quoted:

Mr. Opitz was formerly a foreman in a Riga cotton mill. During the Bolshevik occupation of Riga he went into the interior of Russia to endeavor to recover the machinery of his factory, which had been removed by the Russians before the German occupation in 1917. When the Bolsheviks were driven out of Riga, and out of Latvia, Mr. Opitz was unable to return to Riga. He has just escaped from Bolshevik Russia.

Q. How did you get out? Did you escape through the lines?

A. I came out through Regitza. I left Moscow on 13 November and reached Riga 13 December. All the people in Regitza who come from Tamboff, and other governments which are occupied by Denikin, are sent still farther away from the territory near the front into the interior. People in Moscow are not permitted to leave. In Dwinsk there is a committee which helps fugitives.

Q. Are the conditions in Moscow worse or better than three months ago?

A. The conditions were easier after Kursk was taken by the Bolsheviks, and the state of war was declared raised in Moscow.

Q. Does that mean social conditions or food conditions?

A. In Russia there have been special war regulations. These regulations have been abolished. That is the main reason that life is easier. The food conditions are very bad, worse than before.

Q. Is everybody satisfied now?

A. No one is satisfied with the Government, from the lowest to the highest.

Q. How are the poor provided for?

A. If a poor person shows that he has nothing, he gets some help.

Q. Is there work for everybody? What about laborers and labor conditions?

A. No. Those who have no work receive a small money subsidy from the Government, and some food. There are a great number of these. When a man is without work he must report every two days to the labor employment office, where, if it is proved he is out of work, and can not be given work, he receives a daily allowance of about 60 roubles. Those without work are no longer forced to enter the army.

Q. Is there any reign of terror?

A. No; there is no reign of terror now, but a week prior to my departure from Moscow a plot was discovered and some 200 persons who were supposed to have connection with Denikin were executed. Many former officers were among them.

Q. Is property protected and is it safe to live there now?

A. There is no more plundering or excesses. The government protects the people and their property, but everything is nationalized.

Q. What is the general feeling about the army of Denikin?

A. The population, despite the fact that he is recognized to be a monarchist, is awaiting him eagerly.

Q. Do the courts function so that the people can receive justice?

A. People's courts, over which a soldier and a workman have jurisdiction, administer justice for small crimes. They pass judgment according to their whims.

Q. For large crimes?

A. In larger crimes the courts consist only of commissars, from whose decisions there is no appeal. No counsel can be employed. Those tried have to plead their own case.

Q. Does food come in from the country?

A. Food comes in, but money has no value, and the food can only be procured by barter. The peasants feel a hatred toward the government owing to the constant requisitions.

Q. What is the government requisitioning now?

A. Only food. Before the cold weather notices were put up announcing that everybody must give up a certain amount of clothing. When a house is requisitioned, the owner is not allowed to take everything with him, everything therein being requisitioned.

Q. Are any of the factories working and do they still lack raw stuffs?

A. The factories are all closed. They have a certain amount of raw materials but lack fuel entirely. No wood is being brought to

the city. I have been told, though I do not personally know, that the factories at Tula are working night and day, and also the Putilov works in Petrograd.

Q. Is there any improvement in the railways?

A. At present the condition of the rolling stock is serious, and is constantly getting worse, that in six months there will not be a train running in Russia. At present there is no passenger traffic, the mail trains alone running, and special permits, difficult to obtain, only make it possible for a person to travel on a train. There are no freight trains. Such trains only carry material of war.

Q. Are all men mobilized?

A. Men have been mobilized up to 35 years of age. They have been registered up to 40, but many above the age of 35 are fighting as volunteers owing to favorable conditions to soldiers. The soldiers were against the communists because they said the communists always stayed behind the front. Now all the communists are at the front, and since they have been there everywhere there has been success. The communists have gained a considerable reputation thereby. The various unions—engineers, workingmen, artists, etc.—have to furnish men from 18 to 40 years of age, and a certain percentage of each union must always be fighting.

Q. Are conditions in general in the army better or worse?

A. The discipline of the army is excellent and constantly improving. The various committees elected by the soldiers no longer exist, and a commissar general takes charge of the various army subdivisions. The committees that still exist have only economic functions. The soldiers and their families are better treated than the others. That is the reason the army is growing. There seems to be a plentiful amount of ammunition at Zerpokoff, where the general staff is located, 90 versts from Moscow. There are a large number of guns of English make, which were probably taken from Denikin and Kolchak, in which the shells can be used.

Q. Is there any trade or business?

A. There is no free trade. Everything is sold through the Government, and can be procured only on cards.

Q. Have any new laws been published regarding living conditions?

A. Nothing important.

Q. Do the people get any news from abroad?

A. No foreign news which comes through is believed. It is all believed false.

Q. How are foreigners treated?

A. The foreigners who are now there are not bothered, nor are they mobilized if they can prove their nationality.

Q. Does Moscow stand in close contact with Petrograd and other cities, or does it seem to be isolated?

A. Since Judenitsch's defeat, contact with Petrograd has been restored.

Q. Is there a popular feeling that the Bolsheviks are willing to compromise in some of their earlier theories and doctrines that the thing is swinging over a little?

A. There are no newspapers except the Bolshevik newspapers, and they do not reflect public opinion. Everybody believes that the Bolshevik régime is at an end, and that it can not longer stand as everything is at a standstill. It gets worse day by day. No one picks up the dead horses but their flesh is cleared away by the dogs who eat it.

Q. Do the tram cars run?

A. No.

Q. Is there electricity and lighting?

A. The streets are poorly lighted. Lighting in the city is done by dividing the city into quarters, one week one quarter is lighted, next week another, etc.

Q. Do you think that owing to lack of food, etc., that Bolshevism will fail this winter?

A. No; because the army is well supplied and strong.

Q. Is there any chance of the poor people suffering so that they will try to rise and overthrow the Government? Will this come from below or another way?

A. There is no chance of an uprising from below owing to the fact that the people have lost all courage. They simply die. They are entirely demoralized.

Q. Do you feel that Bolshevism will come to an end owing to the Government realizing that it can not continue further?

A. There is little chance of the Government arriving at a point where it can no longer maintain the army, consequently the end can only come from outside interference.

Q. Are schools running?

A. Only the primary schools. In some of them the children receive food. The greater portion of the instruction in these schools is merely visual instruction and not mental.

Q. What has become of the intelligencia?

A. The intelligencia is now working with the soviets, having been forced into it by starvation.

Q. Were there any facts that struck you as of particular interest or value?

A. Lenin's person is still guarded by a Lettish guard. There is in Moscow still a regiment of Chinese troops 800 to 1,000 strong. There is likewise an international regiment in Moscow, in which

there are a great many Hungarians. There are also Germans in this regiment, and quite a few prisoners of war from Kolchak in Siberia. This international regiment has foreigners in it who are unable to get home. During recent weeks considerable important propaganda has been undertaken by the communists. While it was earlier very difficult to enter their ranks, when one had to have two sponsors, now it is easy. After the recent drive for membership 30,000 (?) were entered in Moscow alone, merely by enrollment.

It was supposed that some of the other existing parties in Russia would participate in the Government, but after the discovery of the recent plot, and the discovery that some of these parties were concerned in it, only Bolsheviks are now in the Government. Other parties exist but they can not undertake any anti-Bolshevik propaganda.

Q. Can you sum up the situation as a whole?

A. The Government is gradually strengthening and the populace willing to submit, hoping ultimately by evolution to work out its salvation, rather than go through another revolution or upheaval by outside forces cutting their way in. The army is daily growing stronger and better disciplined. There is plenty of food but the rolling stock with which to distribute it is lacking, and especially certain parts of the engines which can only be purchased in America.

CONDITIONS IN SOVIET REPUBLIC.

Source: "Izvestia" (Official Organ of Soviet at Petrograd).

3 November, 1919.

"The food conditions in the Soviet Republic are hard, not because Russia by being cut off from the principal bread-producing districts does not have sufficient quantities of grain but principally owing to the class war which has become permanent and continuous. This class war hinders the work of factories and shops, taking away from them labor hands and depriving the Republic of raw materials and fuel, and the lack of manufactured articles renders the exchange of goods between towns and country difficult because the peasants consider money of no value, not being able to buy anything for it.

The peasantry as a whole is not as yet sufficiently far-sighted to be quite convinced of the stability of the soviet power and the inevitability of socialism, and therefore to support the power of the poor without hesitation and fear. The peasants of the producing provinces are not willingly giving enough grain to the towns, and are thus prolonging the class war, which of course ruins them. Food shortage in the towns fosters counter-revolution, and creates the hope

that the towns under the influence of famine will cease to support the soviet power. The more hope the white generals cherish in the discontent of the workmen caused by insufficiency of food, the more energetically they attack soviet Russia.

Thus the peasants by concealing their bread from the bread department monopoly render the conditions harder not only for the workmen but also for themselves. The conditions of the rich peasants are such that their grain reserves must go either for the payment of the debts of the Tsar and his generals, for the assistance of England, America, and France, in the fight with Russian communists, or for the feeding of the workmen, the poor of the towns generally, fighting for the soviet power, for land and liberty, against the generals trying to reestablish monarchy. Which is more profitable for the majority of the peasants?

The condition of the supply of grain in soviet Russia is illustrated by the following table:

[In thousand puds.]

Provinces.	Food grain.	Per cent.	Fodder grain.	Total.	Per cent.
Verenesh	2,110	21.1	2,759	4,859	31.4
Viatke	4,362	29.4	2,981	7,544	24.7
Kasan	5,181	74.9	3,070	8,251	61.1
Kursk	2,305	21.9	1,980	4,288	25.2
Oreol	2,534	158.4	5,191	7,725	54.8
Pense	2,676	102.5	584	3,260	28.1
Riazan	1,196	.....	1,679	3,075	61.5
Samara	22,441	37.4	556	22,997	38.8
Saratov	12,535	41.8	1,227	13,762	44.3
Simbrisk	3,476	57.8	1,313	4,689	39.1
Timboff	8,983	49.9	5,252	14,235	39.5
Tula	1,513	84.1	3,774	5,287	38.3
Total	65,514	42.5	30,466	99,980	38.1

The table shows that during the year from August, 1918, to September, 1919, in all the 12 provinces, 99,980,000 puds of bread and fodder grain were delivered to the State, which constitutes 38.1 per cent of the quantity which was to be received according to the State allocation by province. The delivery of bread grain equaled 42.5 per cent. Thus these provinces gave less than one-half what they could and should have given to the State, which supplies the cities as well as the Red Army, which is fighting for land and liberty. It is no wonder therefore that the Red Army soldier and workmen, but especially the officials, get very small rations of bread, excepting of course those officials at the fronts and in towns situated in grain-producing provinces where foodstuffs are abundant.

Besides these provinces the organization of supply for the State was carried on also in Orenburg, Perm, Ural, and Ufu Provinces. These provinces gave a total of 7,057,000 puds of bread grain, 1,111,000 puds of fodder grain; total, 8,168,000 puds.

In all the 16 provinces during the year were collected 76,571,000 puds of bread grain, which constitute 46.8 per cent, and 31,577,000 puds of fodder grain, which constitutes 32.7 per cent of the quantity expected to be received. The total quantity of grain received from the provinces mentioned amounted to 108,148,000 puds. The quantity fixed for delivery from these provinces amounted to 260,100,000 puds.

Of all the provinces the largest quantity of grain was given by the Provinces of Samara, Saratov, and Tambov, these having supplied 50,000,000 puds, which constitute more than 50 per cent. The provinces which carried out the order most accurately and fully were those of Orel and Pense. They supplied a quantity exceeding the amount demanded. The Tual, Kazan, and Simbirsk Provinces supplied more than 57 per cent, 74 per cent, and 84 per cent, respectively, of the quantity demanded. Other provinces supplied less than one-half of the grain demanded from them, but not less than 21 per cent.

PEASANTRY AND SOVIET AUTHORITY.

Source: "Krasnaya Gazeta," Official Soviet Organ.

3 October, 1919.

At present in Petrograd is taking place the Eighth Congress of the Soviets of the Province of Petrograd. At this congress, in the reports of Comrades Yunosov and Kuzmin and in the discussions of these reports, very interesting information was given on the attitude of the peasantry toward the soviet authority.

Comrade Kuzmin pointed out that in practice the decree on the land was being carried out incorrectly. The working peasantry, represented by the land committees, had set about to gather in all the land. But at that time, the peasantry was still under the influence of the rich elements and following them. The peasants seized all the land, all equipment and live stock, and began to divide this among themselves. In this dividing up, the strongest and richest elements received the greatest benefit. The poor peasants and the former agricultural laborers remained with nothing.

Life itself dictated to the latter the need of union. At about this moment, the creation of the committees of the poor came about. These committees helped to differentiate into classes the peasantry and helped the union of the urban proletariat with the half-proletariat of the village. There began to be organized operating communes, public cultivation of the soil, and soviet economic enter-

prises. Thus, the creation of large common economic enterprises developed naturally.

All the efforts of the soviet organizations work toward making it easier for the peasants to pass to these latter forms of land tenure. For this purpose, there has been created in the Province of Petrograd a special department for managing soviet agricultural enterprises.

On the other hand, requirements of the moment force one to resort to measures which tend to develop opposition to the soviet authority among the peasants. For example, the provincial executive committee has requisitioned cattle from the peasants. Conflicts and misunderstandings have resulted. However, even here it has been possible to explain to the peasants that this measure was necessary in order to meet the needs of our Red Army, to give the latter what it must have.

In this connection the delegates of the congress pointed out that only in isolated instances did one note discontent with the soviet authority among the peasants, as for example, when cattle were requisitioned. It would be a mistake, however, to conclude that the peasantry is counter-revolutionary. The peasant masses have become more conscious and are responding more readily to all the measures taken by the soviet authority. All that is necessary is to remember that the peasants do not have at the present moment all the things of which they are in the greatest need. They must be given everything that they need and they must be given assistance.

Other comrades at the congress pointed out that one must not forget those cases when the peasants passed over to the white guardists. It is necessary to see to it that such elements are removed from the villages.

CHINA, POLITICAL NOTES.

Source: Reliable.

6 January, 1920.

As Chinese politics are largely personal, a brief survey of the affiliations of the leading military men may not be out of place. The northern military party, or Peiyang party, had its origin some twenty-odd years ago in the modern army raised by Yuan Shih-Kai when viceroy of Chihli. It assumed no important political significance until after the revolution when the control of the State passed from the classic civilian mandarinate to the military. During Yuan Shih-Kai's presidency the Peiyang party was divided into two groups, the Anhui Clique and the Chihli Clique. Amongst the then leading members of the former group were Tuan Chi-jui, Ni Ssu-Chung, and Chang Haui-chih, while of the latter Feng Kuo-chang, Li Shun, Wang Chan-yuan, and Li Yuan-hung may be mentioned.

The Anfu Club, so far as its military membership is concerned, is formed principally from amongst members of the Anhui Clique. The following military governors are closely associated with the Anfu Club and generally may be expected to act in concert: Chang Tso-lin of Mukden, Ni Ssu-chung of Anhui, Chen Shu-fan of Shensi, Chang Kuang-chien of Kansu, Chang Chin-yao of Hunan, Chao Ti of Honan, and Lu Yung-hsiang, formerly defense commissioner at Shanghai and new military governor of Chekiang. In opposition to the Anfu Club, the heirs of the Old Chihli faction still control the central Yangtze-Valley—Li Shun at Nanking, Chen Kuang-yuan in Kiangsi, and Wang Chan-yuan in Hankow. Tsao Kun, military governor of Chihli, is "astride the wall" in the Chinese expression. As has been noted, Gen. Hsu Shu-cheng is the Peking representative of those military men who are associated with the Anfu Club. For some months past this group, with its strong provincial support and with Japanese backing, has been in complete control in Peking. There are indications, however, that Marshal Tuan Chi-jui, who still exercises a great influence, has been gradually drifting away from the Anfu party and is coming into closer touch with the president than formerly; with him goes Chin Yun-p'eng, minister of war and acting premier. The president can certainly count upon the support of the three Yangtze Valley governors as against the Anfu Club, and if he is able to attach to himself Tuan and Chin, he may be in a position to defeat the Anfu Clique and regain sufficient authority to put into effect his domestic policies. A further opposition to the Anfu Club exists in Hunan, where there are two military commanders, neither of whom really recognizes the authority of Military Governor Chang Chingyao. The better known of these, Gen. Wu Peifu, was originally a subordinate commander under Tsao Kun, military governor of Chihli, but, since his command in Hunan, has gradually assumed a semi-independent attitude and is commonly regarded as having southern sympathies. He is a bitter enemy of Chang Chingyao and appear to be as popular locally as the latter is unpopular. The other is Gen. Peng Yuhsiang, sometimes known as the "Christian General"; he is by origin a member of the Chihli Clique. He is known to be on friendly terms with Wu Pei-fu and at any moment may make common cause with him against Chang Ching-yao. Like Gen. Wu, he enjoys a high reputation locally. It is generally admitted that these two commanders are in a position to expel the military governor by force if they so desire, and there are now rumors current that they are about to take this step. In such an event it is probable that Hunan would come into line with the other Yangtze Provinces as a neutral province.

To add to the confusion there is no doubt that ex-President Feng Kuo-chang is actively intriguing against President Hsu and is open to make terms with any of the northern militarists who would support him in a claim to be the legitimate president, or, to be exact, in the claim that President Hsu's election was illegal and therefore is void, and that as the legally elected Vice President Feng is entitled to function as president. Gen. Feng has been particularly active during the past few weeks. His affiliations are all with the Chihli Clique, but he is so discredited politically that it is doubtful whether he would be able to command any support from the Yangtze tunchuns in a movement to eliminate President Hsu. Gen. Feng's movements are being watched with much interest.

To sum up briefly the immediate possibilities of the domestic situation: (1) Not only has there been little progress made toward an early conclusion of peace between the north and south, but on the contrary there are a number of indications that hostilities may be resumed unless the control of the Anfu Club in Peking is overthrown; (2) there is a strong possibility of a working arrangement between the President, Marshal Tuan Chijui, the Minister of War, and the Yangtze tunchuns to overthrow or at least to neutralize the power of the Anfu Club in Peking; (3) there is considerable possibility of a localized conflict in Hunan between the military governor and Gens. Wu and Feng; (4) ex-President Feng is actively intriguing for the overthrow of President Hsu—he is discredited and probably will be unable to bring matters to an issue, but, while it is improbable, it is conceivable that under certain circumstances he might secure Anfu support for his schemes, which, in such a case, would become dangerous. Geographically the southwest is independent of Peking, the Yangtze Valley is under the control of northern military men in opposition to the Anfu club, and the northern plain is under control of the Anfu Clique.

The status of the Chinese Parliament at Peking is as follows:

"The Peking Parliament adjourned on 30 September, upon the expiry of the constitutional limitation of the regular session. While not within the scope of this report it may be mentioned that parliament reconvened in extraordinary session almost immediately. There is an entire lack of public interest in the deliberations of parliament, which is recognized as representing public opinion in no particular. It is devoid of influence and for the most part is a dummy in the hands of the leaders of the Anfu Club Its sole claim to importance lies in the fact that the president received his election at its hands, wherefore it is an essential point of policy for the present Government to insist on the legitimacy of the present body as the constitutional parliament of the country."

Reports from southern Fukien and from Kwangtung Province indicate that conditions in the Southern Confederacy are equally as chaotic as in Peking. In that portion of Fukien under southern control, there was open fighting, although not on any large scale, between the locally recruited Fukienese troops and the Kwangtung troops under the command of Gen. Chen Chiung-ming. The countryside generally was groaning under excessive and irregularly conducted taxation. Brigandage remained prevalent.

In Kwangtung much dissension arose over the appointment of a successor to the civil governorship made vacant by the resignation during June of the acting civil governor. The Cantonese themselves were strongly in favor of the appointment of Dr. Wu T'ing-fang to the post. His nomination was opposed, however, by the military clique, who desired to see the military governor made acting civil governor. A number of strikes which took place to support Dr. Wu's candidacy were suppressed by the military. A temporary solution was found by the appointment of the local taoyin (intendant of circuit) to act as civil governor.

The direct authority of the military government does not appear to run beyond a part of Kwangtung Province, and that part of Fukien occupied by Cantonese troops. In Kwangsi, Gen. Yung T'ing is semi-independent, while the military governor of Yunnan, Gen. T'ang Chiyao, controls that Province absolutely and exercises a very great influence in Szechuan as well. In the latter Province a certain amount of friction is still apparent between the Szechuan and Yuannan interests, although there have been no open clashes.

Generally speaking, the only interest in common which unites the southwest is its opposition to the present central government.

Apart from the conflicting ambitions and jealousies of the individual southern military leaders, there is a broadly defined split in the southern military government between the civilian element headed by Wu T'ing-fang, T'ang Shao-i, and others and embracing most of the politicians of the old parliamentary group, and the military element composed of the several military governors, together with the principal generals in the field. The southern military seem disposed to take an independent line in the matter of peace with the north and it would not be surprising to find a peace declared by the northern and southern military groups which would be acceptable to the north and which would have to be accepted by the southern civilian group, as the latter would have no military support left it. Such a peace would in reality be a victory for the northern military, as it would leave them more firmly in control than they were before the last revolution was proclaimed. There is no essential difference between the northern tunchun and his southern prototype, and a

mutual agreement for the perpetuation of the military control of China would be in the interest of both groups.

MEXICO, CONDITIONS IN.

Source: Reliable.

6 January, 1920.

The danger that threatened the Chinese in Sonora owing to the intense hatred of the population toward them in Cananea and other sections seems to have passed, thanks to the decided stand taken by the Federal Government, against the State and municipal authorities, in massing troops and declaring it was ready to use force to extend to the Chinese all the guarantees due them under the treaty. The two American Marines imprisoned at Mazatlan were released on the 30th ultimo. Pedro Gabay shot two of his men, charging them with being spies. Perez Romero, ex-minister to China and Japan, has been confirmed by the Senate as envoy extraordinary and minister plenipotentiary to Belgium and the Netherlands.

From Ario de Rosales and Tacambaro comes information that many of the men who operated under Jesse Cintora, have since his death been surrendering, amnesty being granted them. A party of rebel Yaquis attacked on the 29th the hacienda "El Pardo" near *Guyman* and sacked it, killing two of the employees. The surrender of Roberto M. y Martinez Santiago Hernandez, Gordiano and Jesus de Avila is announced together with followers, approximately 800 men.

The congressional period closed with the defeat of the Obregonistas in the election of the permanent congressional committee, the Government forces winning a victory by obtaining votes of members hitherto thought to have been followers of Obregon. This committee is of the utmost importance as, besides passing upon elections and deciding the same, it has the right of electing an acting or provisional president, should circumstances compel, by any unforeseen event, the retirement of Carranza.

News received on the 31st establishes the fact that Pancho Villa (Dorotes Arango), who was thought to have been trapped in Cahahuila, has succeeded in getting to Chihuahua through the district of Parrol. Flying columns are ordered to pursue him in Chihuahua.

Gen. Dieguez declared on 1 January that Pancho Villa is reduced to 300 men and that federal forces are so disposed as to cut off all chance of his return to Coahuila. He predicts that within two months Villa will meet the same fate as Zapata and Angeles.

The murder of three Mexicans in Jarilla and one at Kyle, Tex., is given wide publicity by the press here by way of proving that crimes

are not always committed in Mexico. On the night of 31 December and 1 January, a party of rebels attacked the suburbs of Orizaba but Government forces under Col. Durazo compelled their retirement after nearly three hours of fighting.

A party of Villistas operating in Durango were attacked by Gen. Amaro forces at the Hacienda de "Tules," where, after three hours' fighting with heavy losses on both sides, the Villistas under Lopez and Silvis Acosta were forced to intern in the Sierra de "Canistas." A decree, increasing export duties on petroleum, was signed by Carranza. On the banks of the River Bavispe in Sonora, between Bacamora and Sahuariya a party of rebels (Yaquis) was routed by a flying column of troops, 500 strong. The Yaquis lost 70 men killed and wounded, and many were taken prisoners.

Branlio Estrada, operating south, is negotiating for the surrender of himself and his men with the Government.

Gen. Everardo Gonzales came near being captured at El Cerro "La Quinta," when routed by Government forces on the 29th. He was only able to escape with a few men, the rest of his forces, about 70 in number, being annihilated.

Gov. Cantri reports that while he permits the entry of Japanese with passports in Lower California, he rejects all Chinese and hopes that the Federal Government will terminate the treaty with China. Ramos Romero of Tobasco is arranging for the surrender of himself and his men.

The crew of the Japanese cruiser *Yacunno* was brought to this city and entertained.

Gen. Java, minister to Cuba, has returned to report on his diplomatic mission. Luis Caballero has surrendered and Gordiano Guzman with many of his men is reported to have done likewise.

The garrison of 40 men at Reynosa Tampo revolted but were discovered and arrested before they had time to join the rebels. Gen. Torres reports that a party of rebel Yaquis, 150 strong, were engaged between Yechepic and Cumites and routed, losing 75 of their number in killed and wounded, the rest fleeing to the Sierra. The news as it filters through shows that an appalling catastrophe was occasioned by the earthquakes of last Saturday and that the victims of same though not as yet exactly known, it is calculated that about 3,000 to 5,000 persons have met their death. The effects have been more serious in and around Jalapa, Orizaba, Cordoba, and Vera Cruz.

Reliable information has been received to the effect that approximately 500 tons of machinery has arrived at Salina Cruz, Oaxaca. Reliable information indicates that the machinery has been sent to Mexico for the purpose of manufacturing arms and ammunition. The shipment was made from Japan by the firm of Kato & Co. and consigned to the same firm in Mexico.

It is also reported that private firms in Belgium are selling arms and munitions of war to Spanish agents, who transmit the equipment to Mexico via Holland. It is alleged that "Certain firms, through ordinary channels of graft and favoritism, possessed large consignments of war material which were subsequently bought from them by Spanish agents."

A large shipment of German rifles and some machine guns, which have been stored for some time past in Chile, are said to be appearing in Mexico.

It is reported that a Mexican by the name of Leopoldo Ortez is in Berlin buying hydroplanes and 140 army aeroplanes, which are being shipped to Mexico by way of Hamburg on steamers bound for South American ports.

According to a consular report, the Mexican consul at Laredo, Tex., is charging a fee of 5 pesos oro nacional or $2 United States currency for viséing American passports, United States citizenship identity cards, and stamping them, "Good for Nuevo Laredo only." An additional charge of 50 cents is made for visé granted after office hours or on holidays. Americans traveling into Mexico are now compelled to secure a new visé from Mexican consuls at each port of entry on the Mexican border, which, consequently, makes entry into Mexico inconvenient and expensive.

Information secured from intercepted letters addressed by H. Medina, subsecretary of foreign affairs to Elsieo, Mexican minister at Madrid, indicate that Arredondo has instructions to purchase aeroplanes, engines, and air bombs in Barcelona, and to make strenuous efforts to secure Winchester rifles.

A contraband shipment of arms valued at 3,000,000 francs was discovered on the Japanese steamer *Ainamaru* destined for Chile. The shipment was made from Japan—the Tarkeikumy Arms Factory being interested. The report originated in the port of Shinagawa, Chile, where a fire was discovered on the vessel. It is presumed that the ultimate destination of the shipment was Mexico.

It is reported that in an intercepted message from the American Federation of Labor of the United States to the Mexican workers, assurance is given by the former that it will always be disposed to defend Mexico in a war with their country, especially as the causes bringing on the war are not based on right and reason.

The Mexican press reports that the Chilean and Nicaraguan Governments support Mexico's attitude in the Jenkins case.

In answer to a report from the United States that representatives of various petroleum companies in Mexico have been holding conferences with members of the American House of Representatives, Mr. Luis Cabrera stated in a interview, appearing in *Excelsior* of the 14th, that difficulties will soon arise between the Governments of the

United States and Mexico, having as an origin and pretext the refusal of the Mexican Government to allow the drilling of new petroleum wells and that the interventionists, whose aims have been frustrated by the satisfactory solution of the Jenkins case, are already seeking a new and unfounded pretext in the supposed restriction of the operations of the petroleum companies by the Mexican authorities.

According to the Mexican press of 15 December, Mr. Manuel Garcia Jurado, Mexican consul in Havana, has advised the Department of foreign relations of the discovery in Matanzas, Cuba, of a filibustering expedition which was to set out on the 11th of January and land 500 Negroes along the coast of Vera Cruz to aid the rebel cause of Felix Diaz. It appears that the expedition was planned by expatriated Mexicans, residing in New Orleans, through an agent in Matanzas named Mateo Rodriguez.

OPINIONS IN SOUTH AMERICA WITH REFERENCE TO THE JENKINS CASE.

Source: Reliable.

20 December, 1919.

The following résumé of a translation of an article appearing in El Diario Ilustrado under date of 9 December 1919, at Santiago, Chile, is published for the information of the service as it gives the viewpoint of that country regarding conditions in Mexico with particular reference to the Jenkins case.

Diversity of language, religion, and habits caused European countries to establish in the Orient the system known as "capitulations," by which arrangement their citizens were withdrawn for most civil and criminal purposes from the jurisdiction of the state making the capitulation. The absence of written law, the essential autocratic generation of judicial officialdom and the state of inferiority that a foreigner usually underwent in states of inferior civilization justified such exemption. Japan was the first to abolish the arrangement and Turkey abolished it during the World War.

Upon the formation of the Spanish-American republics, European countries and the United States initiated in fact an arrangement of "capitulations" under the guise of "reclamations," the number and injustice of which can only be explained by the weakness of the countries accepting them, though the conditions which made necessary the arrangement in the Orient did not exist on this continent.

Organized upon political principles of the greatest liberty and extending to all a most generous hospitality through social and economic constitutions, these republics received foreigners with open arms, giving them the judicial equality of their citizens and even

preference. Though enjoying all the advantages of the citizen, the foreigners had none of the risks either from foreign or domestic conflicts and had in their diplomatic representative, one who would intercede in behalf of their interests. In times of peace they were protected by the law and institutions of the country in which they resided. In times of conflict no sacrifice was forced upon them for the defense of their domicile. On the contrary, the losses suffered were amply paid under the protection of the Government of their nativity and often domicile had been selected in a certain country in view of the fact that the Government of that country was willing to make such adjustments. This line of action has an honorable exception. The English Government has systematically denied such protection with admirable good sense. All voluntary travelers to a foreign country must take into consideration the political and economical risk liable to be encountered in that country.

Our foreign office has always maintained the sound doctrine that foreigners are amenable to the jurisdiction of our courts of justice and has refused all intervention of diplomatic representatives on the questions pertaining to the courts, though on more than one occasion, it has had to yield under the pressure of force.

A few years ago, one of the courts of the republic ordered the arrest of a foreign consul, who was liable to criminal process. To the protest of his Government, our minister of foreign affairs answered that in accordance with international law, the consuls did not have the immunity as recognized for diplomatic agents and therefore the court had a right to order the arrest in conformity with Chilean law.

The imprisonment of the American consul at Puebla ordered by Mexican judicial authorities is in accordance with the principles of international law and all American Governments must consider the question evolved between the United States and Mexico as being one of vital importance to their sovereignty.

CONDITIONS IN GERMANY.

Source: Reliable.

25 November, 1919.

(11328A)

The following is a statement made by a prominent American business man with international connections, who has just returned from a week's trip into Germany.

A Trip into Germany.

18 Nov. to 25 Nov., 1919.

First, in an interview with a workman employed at the local electric light plant in Bentheim, this man stated that he served four

years in the war and was wounded, that he and his fellow workmen considered themselves as having been grossly deceived by the Government. Each day they were told that France was going to fall, and that England would the next day, and when they finally learned the truth they felt they had been deceived and injured. He said that he and his fellow workmen would not go to war again under any conditions, that they would rather go to prison first; they did not care if Germany became a separate Government, a part of France, or a colony of England. Their interest was in work and compensation sufficient for getting clothing and food for their families, and that at present he was making 320 marks per month (approximately $8 in our money at that time), which even with the ration cards for food and war bread, this still was hardly sufficient to feed his family. New clothing was out of the question, as a new suit of clothes would cost not less than 400 marks. This man was not socialistic or radical, and did not take any interest in politics or the Government, but wanted to be left alone to work with a hope that his work would produce enough to feed and clothe his family and live in some degree of contentment.

I also talked with the assistant manager of the Bentheim electric plant. Bentheim is a small town with a population of 3,200 people. He said that 100 men who went to war from Bentheim were dead. He felt that the German people had been held so long in submission that they were not ready for a democracy and that they would follow any leader who even promised to give them enough to eat; that wages, coal, and everything used in their plant had gone up tremendously, and although their rates for light and power had gone up from 50 to 85 pfennigs for a kilowatt hour in the case of light and from 40 to 55 pfennigs for a kilowatt hour in the case of power, these increases were not sufficient to give them a profit.

Berlin.

I went to one of the larger factories, in which factory 9,000 men were working, and which before the war employed 15,000 men. The factory superintendent said that the efficiency of the laborers was about 75 per cent, measured in output per man per hour. The efficiency had been further cut down by the application of the eight-hour day. The men and women in the plant looked pale but otherwise in good condition. But you did not see the typical stout German that you would before the war. Wages had gone up and they were paying from 20 to 30 marks per day. These wages he stated were hardly sufficient to properly feed their families. Food was now a little more plentiful than it was, but there still was a scarcity of flour and fats, and that war bread was still in use. Clothing was so high as to be prohibitive for the working men. The employers whom

I was talking to thought that the men were more content to stay at work now after the two months' strike which had caused great suffering and big losses to men and employers. That if they got through this winter all right, the worst would be over.

There are four serious shortages: First, of food; second, of coal; third, of transportation; and fourth, of raw material. Food, especially fats and flour, and also cotton for manufacture of clothing should be sent into Germany; they would relieve great distress and make the situation a great deal safer for the future, not only in Germany but in other countries. There does not seem to be a necessity for us to supply raw material in long-term credit. To supply that which is absolutely necessary would be sufficient to tide over Germany and prevent a revolutionary rising, and this could be done on short-term credits. In the factories there were a great many evidences of a lack of raw material, especially copper, cotton, and rubber, and the question of continuance of the operation of the factories depended upon coal and the regular supply of coal. Neither of these are to be depended upon.

I also talked with Dr. Carl Guyer, the new leader of the Independent Socialistic Party. He thought there was no doubt that a monarch of any kind could not return to Germany. He said if such effort were made that there would be an intense struggle and that Germany would go to the soviet form of government before it went to any form of monarchical government. He intimated that the Socialists' strength was in the cities and among the industrial population, and that the peasants and people who worked on the farms were conservative. He felt sure that the new laws allowing labor a voice in the management of industries would avoid a good many of the troubles that had been encountered in Russia. He also thought that the winter would be a difficult and severe one, that the Government was weak and that within six months to a year Germany would go to a much more radical form of government than the present.

I was impressed with the fact that everything in Germany seemed dirty—streets, street cars, trains, etc.—in marked contrast with prewar conditions of order and cleanliness.

ROUMANIAN NOTES.

Source: Reliable.

8 January, 1920.

It has been reported that an attempt is being made to repudiate the treaty as signed for Roumania. The cabinet which would not sign was replaced by another party which were largely Transylvanians. The election of the party which signed was declared to be illegal by the other Government and they are contemplating plans

to declare it void and hence declaring that the agreement on the part of Roumania is not properly binding.

It is said that Roumania is able to supply only 1 per cent of the world's demand for oil. The British are not much interested in Roumanian oil, as the supply is so small and its location makes the supply unreliable in cases of emergency. At present the active people in Roumania are the French.

DENMARK, POLITICAL NOTES.

Source: Reliable.

31 December, 1919.

The following speech by Prime Minister Zahle on the subject of Schleswig is interesting as it gives the stand of the present government on the subject. This is by no means the opinion of all parties, as the Conservative parties want all of Schleswig returned to Denmark. This feeling is most intense and there is a strong desire among these parties to have America represented on the commission with England and France to supervise the plebiscite, as they for some reason believe America will throw her influence on their side.

We Danes can not influence the circumstances which caused the postponement of the enforcement of the peace treaty longer than was expected. We have no right to complain that conditions are not as we would have them, but we must quietly await the natural sequence of events.

There is, however, one point open to discussion. It is that portion of the Peace Treaty which directly concerns us. We are filled with gratitude to the Allies, whose victory leads to the fulfillment of our national desire for the union of all Danes into one nation. But we have, naturally, our own views concerning our own affairs, and these views we must maintain as a free and independent people.

We desire a national State which embraces as far as possible all Danes, but at the same time one which, as far as possible, embraces only all Danes, and one that does not include any more foreign elements than absolutely necessary.

The ministry stated its position on the eve of public negotiations. We stand by it unreservedly, and will at all times take the full consequences. We feel sure of having the greater majority of the Danish nation on our side, both north of and south of the King's River (Kongeaa), but even did we not, we would not abandon our attitude in a matter of such importance to the future of our nation.

Nothing worse could happen to Denmark than the influx of a large German population within our frontiers. We therefore do not desire that people who were German yesterday should vote Danish to-day because of a possible pecuniary advantage thereby accruing to them for then there would arise the question of their becoming German again to-morrow, or as soon as they had realized the expected

pecuniary advantage or had experienced disappointment through the fact that said pecuniary advantage did not materialize.

We now want to carry out the Danish Schleswig claim that Danes should be allowed to remain Danes and Germans Germans. We do not want to continue the policy of compulsion that has been pursued in South Jutland. The efforts of the ministry will aim at the complete amalgamation of the Danish part of Schleswig with the kingdom, so that in every respect it will form an integral part of it. This aim can only be realized if the people coming to Denmark from Schleswig are Danes, so that all may be fused into a people of homogeneous nationality.

However energetic our efforts toward this end may be, the amalgamation even of the wholly Danish part of northern Schleswig and the kingdom is no easy matter. It will take some time before Danish law and Danish administration can be carried through in that part of Schleswig to be incorporated with Denmark. The ministry's daily occupation with the details of this question has revealed the thousands of difficulties arising from the sudden transfer of a population to the customs of another municipal and State administration, to which it is not only unaccustomed, but with which it is completely unfamiliar. If we were to take in a group of pro-German elements, the amalgamation work would be rendered even more difficult.

The continuous fall of the mark necessitates considerable economic sacrifices on the part of the kingdom for the purpose of helping Danish Schleswig in the economic losses they suffer undeservedly and which are too heavy to be borne by them alone. The ministry has worked on this matter with the supposition that the population of the kingdom is not only willing but positively desirous that the Danish exchequer should bear considerable sacrifices. But when some people consider that Denmark's financial resources are unlimited they are doomed to disappointment. They are doing their country a bad service, who write and talk about the transformation of the currency at par, thus arousing exaggerated expectations through half promises which will only prove to be more than half empty.

OPERATIONS.

SUMMARY OF BRITISH NAVAL ACTIVITIES SINCE THE SIGNING OF THE ARMISTICE.

Source: Reliable.

(12490A.)

Employment of the Fleet.

The conclusion of the armistice, while freeing the Navy from its main task of opposing the German fleet, left several subsidiary campaigns uncompleted, besides opening new theaters of operations in the Baltic and Black Seas.

North Sea.

The services of the Navy were called upon in assisting to enforce the actual terms of the armistice. Immediately upon its conclusions, the Grand Fleet was engaged in taking over the German ships for interment, and escorting them to Scapa Flow, whilst the Harwich force took over the surrendered German submarines. A portion of the main fleet was constantly employed in watching the ships interned at Scapa Flow up to the 21st June, when the German ships were scuttled by their own crews.

On the 3d December, 1918, H. M. S. *Hercules*, accompanied by a light cruiser and four destroyers, proceeded to German waters with the Allied Naval Armistice Commission. These ships returned on the 20th December, and since that date one, and on occasions two, light cruisers have been visiting German ports on duties connected with the armistice terms. Four destroyers have been allocated to convey provisions, despatches, etc., to these ships. H. M. ships have also assisted various commissions in the enforcement of agreements as to the surrender of matériel and German merchant shipping. The number of German merchant ships surrendered up to 22d November was 346.

Baltic.

When, on the conclusion of the armistice, the entrance to the Baltic Sea was again opened to surface ships, a naval force proceeded to the Baltic with the primary object of insuring the supply of arms and munitions to Esthonia and Latvia. The force originally consisted of five light cruisers, nine destroyers, and two aux-

iliary ships. The admiral in command was instructed that the policy of H. M. Government was to prevent the destruction of the Esthonian and Latvian provinces by external agency. He was, therefore, to employ his forces as necessary to prevent aggression by Bolshevik forces against those territories.

The British force operated in the Gulfs of Finland and Riga, and off the coast of Latvia until early in January, 1919, when ice conditions forced a withdrawal to Copenhagen. Several refugees were brought away from Libau and Riga.

During this time the Bolshevik advance in Courland had progressed and on the withdrawal of the British ships Riga fell into the hands of the Red Army.

In January the naval force was reduced, but periodical visits to Libau were arranged.

Early in April ice conditions once more permitted navigation of the Gulf of Finland, and the menace to the Baltic States from Bolshevik ships again necessitated the presence of British ships at Reval. This fact, and the further complication introduced by the attitude of the Germans in failing to evacuate their troops, rendered essential a gradual increase in the strength of the British naval forces.

The duties falling on H. M. ships, in pursuance of the policy of aiding the national governments of the Baltic States, have consisted principally in their presence at threatened ports, especially where the representatives on shore of the Allied Governments have required support, and also in the control of shipping and supplies in the Baltic.

Actual hostilities were opened on 31 May, 1919, when a Bolshevik battleship and four small vessels, accompanied by bombing aircraft, came out from Kronstadt. Fire was opened first by the Bolshevik vessels on our ships, and this fire was returned. The discrepancy in strength of the two forces, the Bolshevik fleet counting battleships among its units, necessitated the war being carried into the enemy's camp to insure the safety of our ships against attack by superior forces.

On the 17th June a Bolshevik cruiser was sunk by a single coastal motor boat in the Gulf of Finland. An equally daring and gallant attack was carried out by a small flotilla of coastal motor boats on Kronstadt Inner Harbor on the 18th August. The flotilla made its way through the chain of forts to the harbor and torpedoed several vessels lying at anchor. The attack was carried out in cooperation with units of the royal air force, whose assistance was of the greatest value.

Allied ships have from time to time been associated with the British forces.

The political and military situation in the Baltic has remained confused throughout the autumn. An attempt to capture Petrograd by the Northwest Russian Army under Gen. Yudenitch, assisted by Esthonian forces, gave promise of success, but was followed by failure and retreat. The withdrawal of H. M. ships from the eastern Baltic was subsequently ordered because of ice conditions.

North Russia.

At the time of the armistice, the following British warships were in North Russian waters:

At Archangel, two monitors, four gunboats, and ice-breaking vessels;

At Murmansk, battleship *Glory;*

At Pechenga, Russian cruiser *Askold* (manned by a British crew);

with 20 small craft, which were distributed as their services were required.

Askold was withdrawn in March, 1919, and paid off. Two hundred and fifty royal marines, who had been operating under the military on shore, returned to the United Kingdom in June, 1919.

Early in 1919 it was decided to reinforce the naval expedition at Archangel in order that operations might be undertaken on the River Dwina as soon as the ice conditions permitted.

The ships allocated for this purpose were 1 light cruiser, 6 monitors, 2 gunboats, 4 mine sweepers, a sloop, an aircraft carrier, a repair ship, and a large number of auxiliaries and small craft.

The vessels assembled at Murmansk at the beginning of May, and proceeded to Archangel when the ice conditions allowed, the White Sea being open to navigation by 5 June.

The River Dwina, however, was clear of ice early in May, and this allowed the river craft, which had been iced in at Archangel during the winter, to commence operations before the White Sea was open. By the 15th May two gunboats were engaged on the River Vaga, while two monitors and two gunboats were cooperating with the miltary forces at Kurgomen on the River Dwina.

By the middle of June the reinforcements from Great Britain had arrived at Archangel, and the Archangel River expeditionary force supported the military forces in their operations on the Dwina during the summer.

On the 21st July news was received of a mutiny among the Russian troops cooperating with the British at Onega, as the result of which a force of about 850 royal marines was dispatched from the United Kingdom to Murmansk to act under the military authorities, the monitor *Erebus*, armed with 15-inch guns, being sent to the White Sea at the same time.

In consequence of the turn which events took, it was decided that the plans already made for the evacuation of North Russia before the winter set in should be proceeded with at once, as soon as the necessary transport could be sent out. To facilitate the evacuation, a heavy blow was to be delivered against the Bolsheviks, thus enabling the North Russians to occupy our positions as we withdrew.

An advance up the river ended with the capture of Chidinova and Borok, in which the River Force participated, being in action during the second week in August against the Bolshevik flotilla. On the withdrawal of the expedition the river was heavily mined, this measure effectively impeding the movements of enemy craft.

Throughout all the river operations valuable assistance was rendered by seaplanes of the R. A. F. in reporting the dispositions of the enemy and in spotting for our gunfire and bombing the enemy's positions.

The evacuation of the British and Allied forces from Archangel was complete without hitch by the 27th September. All the naval forces were withdrawn except two monitors. These could not be brought down stream owing to the shallowness of the water, and were demolished in the river, after they had been dismantled and all material of value removed.

With the exception of a few transport craft, and two mine sweepers which were wrecked during mine-sweeping operations, these were the only ships lost by the expedition.

The war vessels and other craft evacuated from Archangel proceeded to Murmansk to assemble there for final departure to the United Kingdom. The evacuation of Murmansk was completed on the 12th October.

Black Sea.

Since the arrival of the Allied fleets at Constantinople, after the cessation of hostilities, British naval forces have been engaged in enforcing the terms of the armistice with Turkey and in assisting Gen. Denikin and his volunteer army in operations against the Bolsheviks.

When the Bolsheviks had occupied Sebastopol and had driven the volunteer troops from the greater part of the Crimea, the support of the British ships held up the attempted Bolshevik advance into the Kertch Peninsula, and eventually enabled the volunteer army to recapture the whole of the Crimea. Similarly in the Sea of Azov and elsewhere the volunteer army was supported by the gunfire of our ships.

When the volunteer army had retaken Nicolaief from the enemy they were supported by our ships in the landing operations that led up to the recapture of Odessa. In fact, the cooperation of the

British Navy rendered possible the expulsion of the Bolsheviks from the whole of the northern coast of the Black Sea.

Caspian Sea.

Before the armistice the importance of the control of the Caspian for the defense of our Indian interests had been realized, and ships had been taken over and manned by British naval personnel. After the armistice this policy was actively developed. The use of the sea was denied to the Bolsheviks; Baku was occupied and its oil supply was made available for the Russian volunteer forces; and the right flank of the British forces in the Caucasus was protected.

Our ships operated in the Northern Caspian during Gen. Denikin's advance toward Astrakhan. Several actions were fought with the Bolsheviks, culminating in a very gallant attack, on 21 May, 1919, on the Bolshevik fleet at Fort Alexandrovsk, where they had established a base. Several of the enemy ships were sunk, and the remainder fled to Astrakhan. After this action the Bolsheviks never again showed fight on the Caspian Sea and their demoralization greatly assisted Gen. Denikin in holding Tsaritsyn, a place of capital stragetic importance. The ships have now been handed over to the Russian volunteer forces, and the British personnel withdrawn.

On incidental but important feature of the presence of the British Navy in both the Caspian and Black Seas has been the reopening for trade of districts that had been closed to British enterprise for five years past.

Siberia.

A British man-of-war has been maintained at Vladivostok, and has worked in cooperation with the British military mission supporting Admiral Kolchak. Naval guns were mounted on an armoured train which was used with conspicuous success on the Ufa front. These guns were afterwards mounted in barges and steamers on the River Kama, being finally turned over to the Russians, and the British naval personnel being withdrawn.

General Service Abroad.

Besides the active operations that had to be undertaken in Russian waters, the Navy has played a prominent part in assisting to maintain peace and order throughout the world during the unrestful period of resettlement that has followed the Armistice.

Adriatic.—In the Adriatic, British light cruisers and destroyers cooperated with Allied forces in controlling the situation at Austrian ports and on the Dalmatian coast.

Danube.—Gunboats and motor launches have been employed on the Danube in enforcing the terms of the armistice.

Ægean.—In the Ægean Sea the Navy, besides maintaining communications from Malta to our forces in the Black Sea, took part in the operations during which Allied forces were landed at Smyrna.

Egypt.—During the disturbances in Egypt the Navy kept open communications by wireless and assisted generally in controlling the situation.

Red Sea.—In the Red Sea the navy cooperated with the military in operations at Hodeida and on the Somaliland coast. British ships were also employed until the end of August in controlling the dhow traffic in the Red Sea.

China.—The river patrols on the Yangtze and West Rivers have been reestablished, and the British commander in chief has carried out a cruise on the former river, the British flag being shown again at many ports where it had not been seen since before the war, and at ports on the West River tributaries where the white ensign has never previously been seen.

Other foreign stations.—At the present time the principal ports of all nations are being visited for the purpose of showing the flag where it has not been seen since before the war, and, where necessary, preserving order and protecting British subjects.

H. M. S. "Renown."

H. M. S. *Renown* left Portsmouth on the 5th August to convey Capt. H. R. H. the Prince of Wales to Canada, and was met at St. Johns by two light cruisers, which subsequently returned to England. After visiting the West Indies and Rio de Janeiro—the latter place in order to return a visit paid by a Brazilian squadron to England—*Renown* returned to New York, where she embarked H. R. H. and sailed for Halifax and England on 22d November, escorted by a light cruiser.

Home Waters.

The situation in Ireland has necessitated the fairly continuous employment in Irish waters of 6 destroyers, 3 sloops, and 16 motor launches. These numbers have been increased temporarily from time to time.

During the period of industrial unrest that has followed the armistice in Great Britain the Navy has been called upon to help the Government in maintaining essential public services.

One thousand five hundred officers and men were engaged on pumping duty in the West Yorkshire coal field during the coal strike of July and August.

In August H. M. S. *Valiant* and two destroyers were stationed at Liverpool in case they were required during the police strike.

During the railway strike, in September and October, ships were used for carrying food round the coast, especially for the carriage

of yeast, and for conveying military forces; others were held in readiness for diverting sea-borne traffic, and maintaining wireless communication. Personnel was landed for the protection of certain vulnerable positions and the working of various dock gates and power stations round the coast.

Mine Patrols.

Destroyers have been employed to cope with the drifting mine danger at various points, mainly on the East Coast.

Atlantic Flight.

Two battle cruisers were stationed in the Atlantic to assist in the flight of the rigid airship *R–34* to and from the United States.

Exercises, Cruises, and Ceremonies.

In view of the many calls on the fleet for other purposes, little opportunity has occurred for fleet exercises or cruises.

Squadrons of the Atlantic Fleet paid a visit to French ports in April, and officers and men of the squadrons were entertained in Paris by the French Government, together with Admiral of the Fleet Sir David Beatty, who had hauled down his flag a few days earlier.

Representative detachments from the fleet took part in the Victory marches both in Paris (14th July) and London (19th July). A portion of the Atlantic Fleet paid a visit to the Thames during this week, and visits to it were arranged for members of the House of Parliament.

The summer cruise of the Atlantic Fleet commenced on the 2d September, visits being paid by units of the fleet to various seaports round the British coast. Exercises were subsequently carried out.

Mine Clearance.

One of the largest tasks that confronted the Allied navies after the cessation of hostilities was that of clearing the seas of mines, which had been used in this war on a quite unprecedented scale.

The waters to be swept were distributed among the Allies according to their resources, those allotted to the British comprising the coasts of the British Isles, the North Sea as far east as longitude 4° E., and various areas in the Mediterranean and abroad.

Some idea of the task involved may be gathered from the fact that during the war no less than 1,360 mine fields or groups of mines were laid by the Germans in proximity to our coasts, totaling some 11,000 mines, about 90 per cent of which were laid by submarines; in waters abroad to be cleared by the British about 60 fields or groups, totaling some 1,200 mines, about 60 per cent of which were laid by submarines; while British mines, which had also to be swept up, numbered about 65,000 in home waters and 8,000 in the Mediterranean.

The arrangements for the organization of the mine clearance service had been worked out in detail before the armistice, and were brought into force on the 1st December, 1918. Home waters were divided into areas and placed under mine clearance officers, who received operational orders direct from the Admiralty; mine clearance officers were also appointed to act under the commanders in chief aboard. Other bases were established at Lervikstord in Norway, and at Zeebrugge and Ymuiden.

The number of mines known to have been laid during the war being no criterion of the number remaining to be swept up, it was decided to cover twice all localities in which mines were laid, and, where necessary, three times; and forces were allocated to the various mine clearance officers with a view to this work being accomplished by the end of November, 1919. When operations were fairly started about 1,000 vessels were employed in all areas. By the 1st April, 1919, these had been reduced to 421, by 1st July to 285, and by 17th October to under 100.

The ships employed were at first manned by the officers and men who had been engaged on mine-sweeping and patrol duties during the war. In order to enable these men to take their proper turn for demobilization if they so desired, this arrangement was speedily replaced by one under which volunteers for this special duty were invited to sign on for a period of three months, receiving extra pay for the risks involved.

This was a temporary expedient only until a distinct mine clearance force could be formed, on a definite engagement to serve until the 30th of November, 1919. On the inauguration of this force on the 1st of April, 1919, volunteers came forward in large numbers, and the force was quickly brought up to its authorized strength of about 600 officers and 15,000 men.

In spite of the rearrangement and complications involved by these changes in the manning system, the difficulties have been so successfully overcome by the officers concerned in the organization and operation of the force, that the work of the mine clearance has been accomplished well within the scheduled time. The discipline of the force was good and its spirit excellent.

It was laid down as the primary principle in the clearance operations that all possible precautions were to be taken to obviate loss of life. Risks had frequently to be taken; in the northern barrage, for example, mines had been laid only 6 feet below the surface at low water, while the slight tidal range was nullified, as a rule, by motion caused by the sea. Here a special form of sweep was devised which to a large extent protected the vessels engaged; and generally risks were reduced to a minimum by working tidal restrictions and

utilizing the cooperations of aircraft as much as possible. So well were precautions observed that the total loss of life during the operations has been very small.

Mine clearance operations in the areas allotted to Great Britain are now complete, and these areas are open to navigation and are, it can be confidently asserted, free of moored mines. Until the mine fields, for which Great Britain is not responsible, are cleared, drifting mines will continue to be present for some time, and will constitute a small but unavoidable danger to navigation.

In addition to mine clearance operations proper, large areas have been bottom-swept with particular regard to fishing grounds.

This form of sweeping is still in progress, and will be continued after 30th of November by the post-war mine sweeping flotilla (manned by permanent naval ratings) as opportunity occurs.

Belgian Coast Reconstruction.

Under the direction of the admiralty various works of salvage and reconstruction have been carried out on the Belgian coast, at the cost of the Belgian Government.

The work included the dredging of the port of Ostend, the repair of the large maritime dock and the reconstruction of the lock gates; the erection of a semipermanent fixed bridge over the Nouvel Avant-Port in place of the swing bridge destroyed by the Germans, the provision of 15 traveling cranes of portal type, the reconstruction of the railway system in the docks, and other works. At Zeebrugge the damaged swing bridges over the entrance lock to the Zeebrugge-Bruges Canal have been rebuilt, the caissons closing the lock entrance and other portions of the lock repaired, the gap in the viaduct leading to the Mole restored, and 10 traveling cranes of portal type have been erected on the Mole. All this work has now been completed.

Dredging operations commenced at Ostend at the end of January and continued night and day. At the same time salvage work was carried on upon the remains of H. M. S. *Vindictive* and of small craft which had been sunk in the harbor by the Germans. By the 15th of June salvage and dredging had been carried so far that cross-channel services into Ostend could be resumed without involving delays due to tides.

At Zeebrugge the steamship *Brussels*, which had been sunk off the end of the mole, and various smaller craft, were lifted, and the cranes, railway wagons, and other gear that the Germans had thrown into the harbor, salved.

Readjustment to Peace Conditions.

The many duties that devolved upon the fleet during the clearing-up period militated against rapid demobilization or an early return to peace strength.

Fleet at Home.

Between the 11th November, 1918, and the signing of the peace treaty, in June, it was necessary to keep the fleet in home waters at a very full strength, both on account of operational necessities, especially in the Baltic (the ships for which are provided from the home organization), and because active measures might have been necessary to induce the Germans to sign the peace treaty.

Early in December, 1918, however, orders were given for a considerable number of ships in home waters to proceed to their home ports and grant their crew the 28 days' demobilization leave that had been specially approved. These ships were those required to prepare for foreign service, or to reduce to "home fleet" status or reserve, so that by the end of March many squadrons that had been in existence at the time of the armistice had already disappeared.

A further reorganization was made when Admiral of the Fleet Sir David Beatty hauled down his flag on 7 April. On that date the Grand Fleet ceased to exist, and the new "Atlantic Fleet" came into being. It was at first intended that a home fleet should be formed of ships manned by nucleus crews; but considerations of economy necessitated an additional reduction, and the ships designated for the home fleet are now to be laid up "in reserve."

When this reduction has been effected, the position of the fully-commissioned fleet at home, as compared with the Grand Fleet at the time of the armistice, will be as follows:

Battle squadrons, reduced from four to two.
Battle cruiser squadrons, reduced from two to one.
Cruiser squadrons, reduced from two to none.
Flying squadron, reduced from one to one.
Light cruiser squadrons, reduced from seven to two.
Destroyer flotillas, reduced from six to four.
Submarine flotillas, reduced from six to three of much smaller size.
Fleet-sweeping flotillas, reduced from three to none.
Mine layers, reduced from one squadron and one flotilla to one ship.

Apart from the main fleets, the auxiliary patrol organization comprised at the time of the armistice 27 separate areas or commands with bases round the coast. The auxiliary patrol was broken up after the armistice, and the 27 commands have by now been reduced to the five commander in chiefs' commands at Chatham, Devonport, Portsmouth, Rosyth, and Queenstown. A few other bases have been retained temporarily to cope with the work of demobilization and reconditioning, both which duties will shortly cease.

Large destroyer and submarine forces, additional to those already enumerated, were attached to 12 of these local commands. These have been laid up, with the exception of four small defense flotillas based respectively on Chatham, Portsmouth, Devonport, and the Firth of Forth, and of the Irish force. Three semi-independent submarine-hunting forces, which had been constituted prior to the armistice, have been similarly disbanded.

The majority of the ships withdrawn from the various home commands have been placed in the reserve, or on the list of ships for disposal. A certain number have been attached to the gunnery, torpedo, wireless, and navigation schools for training, and experimental purposes; the number of these is greater than before the war, in accordance with the policy that special attention must be paid to training and experimental work. With the same object peace establishments for training in submarine and antisubmarine work are being maintained at Portsmouth and Portland. Vessels are being detailed for surveying and fishery protection duties.

Foreign Stations.

The large forces of armed merchant cruisers, ocean escorts, and small vessels which were employed on convoy duty against submarines and raiders have been demobilized.

Mediterranean.

The Mediterranean station at the end of the war was under a commander in chief, with five substations, each under a rear admiral or commodore, viz: Gibraltar, Malta, the Adriatic, the Ægean, and Egypt. This territorial arrangement is being superseded by the peace organization, which comprises a commander in chief, one rear admiral in the battle squadron, one rear admiral commanding the light-cruiser squadron, and officers in charge of the bases at Malta and Gibraltar. Officers are being retained temporarily in command of the Egypt and Ægean divisions to complete the progress of demobilization, and to be available in any political emergency that may arise from the disturbed conditions of these areas.

The battleships, light cruisers, and torpedo craft which were employed in the Mediterranean at the time of the armistice have all returned, and the process of replacing them by more modern vessels is nearly complete. A large proportion of the auxiliaries on the station have been returned to their owners, and the remainder are being brought home as rapidly as the progress of demobilization and the political situation allow. The assistance rendered by naval craft to the army and air force in their arrangements for demobilization and evacuation of bases has affected the rate of withdrawal.

America.

The commands on the coast of America consisted at the armistice of three stations—North America and West Indies, east coast of South America, and Pacific coast of America. These have been replaced by two commands, under the commander in chief North America and West Indies, and the commander in chief South America, respectively. The old ships on these and on the Africa, China, and East Indies stations have been withdrawn, and the more modern ships which are to replace them are being sent out as crews become available.

Australia.

The Australian station has reverted to the control of the Commonwealth Government.

Demobilization of Personnel.

The strength of the Navy at the date of the armistice (including the mercantile marine reserve, but excluding the royal naval division) was 415,162. Of these, 36,243 were officers and 378,919 men. About 24,000 officers and 235,500 men were serving on engagements expiring at the conclusion of the war.

The following figures show the progress of demobilization up to the middle of November:

	Numbers demobilized (including M. M. R. and excluding R. N. D.).	
	Officers.	Men.
Mid January	1,800	25,000
Mid February	4,000	92,000
Mid March	6,000	140,000
Mid April	8,200	168,000
Mid May	11,500	189,000
Mid June	13,600	202,000
Mid July	16,100	213,000
Mid August	17,400	220,000
Mid September	18,600	226,000
Mid October	19,700	229,000
Mid November	20,900	232,000

The demobilization of officers and men serving in home waters was carried out under a standardized procedure from all ships and establishments concurrently, thus avoiding the use of dispersal centers.

Owing to the number of ships that had still to be kept in commission, demobilization had at first to be kept carefully in hand; but in spite of this it was found possible to release over 7,000 officers and 154,000 men by the end of March.

The repatriation of the Colonial Naval Reserves, amounting to over 2,000, and of about the same number of men who had come from abroad to join the Imperial Naval Forces, was effected at a comparatively early stage.

The strength of the Women's Royal Naval Service was at the time of the armistice 4,821 of all ranks. This force has now been demobilized.

Apart from the demobilization of officers and men due for discharge, it is intended to reduce the permanent personnel of the Navy by the end of December to somewhat below the total voted for 1914–15. Men who apply for their discharge will therefore be permitted to take it, provided that they belong to branches in which a surplus exists, and that the total numbers so discharged do not exceed a certain figure; and a higher standard of character and ability than was possible during the war will be insisted upon in future both for first entry and for reengagement. The extent of subsequent reductions will depend upon the strength at which the fleet is to be maintained in future years, a question which is being considered in connection with the provision required for 1920–21.

Naval Pay.

One of the most urgent needs at the time of the armistice was the preparation of revised scales of pay for the officers and men of the fleet. The existing rates had been increased but slightly during the previous 60 years, and had quite lost touch with the prevailing value of money and the salaries and wages obtainable in civil life.

Committees were appointed to suggest new scales in detail, and pending their reports ad interim increases were brought into force as from the 1st February, 1919.

The revised rates were finally approved by the Government in May, 1919, and besides effecting a considerable simplification in the scales in force at the time of the armistice, provided a substantial increase over those scales. This increase, though varying between the different ranks and ratings, averaged about 100 per cent.

At the same time the scale of allowances for officers and men, of half and retired pay for officers, and of long-service pensions for men, were brought under review, and improvements in them were effected.

Naval Education.

During the war it was not possible to give officers and men normal courses of instruction, with the result that on the conclusion of the armistice there were considerable arrears to be made up.

All the naval educational establishments, many of which had been closed during the war, were reopened as soon as possible, and every

effort has been made to resume fully the teaching of professional subjects. In addition a series of educational courses, each lasting six months, has been instituted at Cambridge for junior officers who had been unable, owing to the war, to complete their full training in the cadet colleges. The first of these courses was begun in January last.

The R. N. college, Keyham, which during the war was used for the training of special entry cadets, is now being used as was previously intended, for the training of engineer officers.

Reference is made below, under the heading "Naval staff organization" to the institution of a Naval Staff College at Greenwich.

Revision of Shipbuilding Program.

Of the vessels under construction at the time of the armistice, those were completed whose construction had proceeded so far that cancellation would have been uneconomical having regard to the possibility of their useful employment upon naval and other work. The following table shows the numbers involved and their disposal according to their various classes:

Type.	Ordered and under construction 11 Nov., 1918.	Since canceled.	Completed 31 Oct., 1919.	To be completed.
Battle cruisers	4	3	.....	1
Light cruisers	21	4	8	9
Flotilla leaders	11	4	4	3
Destroyers	97	40	41	16
Patrol boats	1	.....	1	.....
Submarines	73	33	20	20
Aircraft carriers	2	.....	.....	2
Mine layers	2	2	.....	.....
Twin screw mine sweepers	99	36	[1] 57	6
Paddle mine sweepers	5	5	.....	.....
Patrol gunboats	56	31	24	1
Trawlers	259	[2] 215	44	.....
Drifters	206	[3] 173	31	2
Boom defense vessels	29	1	26	2
Tugs	99	[4] 43	47	9
Seaplane towing lighters	23	19	4	.....
"24" class	11	2	8	1
Mooring vessels (excluding motor boats)	7	.....	4	3
Total	1,005	611	319	75

[1] Including 6 completed as surveying vessels.
[2] Including 133 building canceled for the Navy but completing for private use.
[3] Including 109 building canceled for the Navy but completing for private use.
[4] Including 25 building canceled for the Navy but completing for private use.

Disposal of Ships and Stores.

The following statement gives the number of ships sold by the Admiralty since the armistice up to the 24th November, 1919, including obsolete warships sold for breaking up:

Battleships	2
Cruisers	2
Destroyers	42
Torpedo boats	22
Gunboats	7
Submarines	11
Sloops	2
Whalers	5
Yachts	8
Motor boats	3
Motor launches	67
Tugs	3
Trawlers	167
Drifters	39
Miscellaneous	11
German submarines (sold on allied account)	56

In addition, considerable quantities of material as part of liquidations of contracts have been dealt with.

Numbers of small craft and large arisings from dockyards, ships, and local depots all over the country have been sold by arrangement with the disposals board, to whom the proceeds of sale will accrue.

Revision of Works Program.

The program of the construction of works on shore has been revised on the same basis as the shipbuilding program.

Twenty-nine works, estimated to cost £198,595, which had been approved, but had not been commenced at the date of the armistice, were canceled.

Fifty-four works, estimated to cost £2,444,401, which were in progress, have been stopped, an average of 45 per cent on each work having been completed.

Eleven works, estimated to cost £889.535, are being completed on revised lines at an average reduction of 35 per cent on the scale of the original proposals.

Admiralty Outport Establishments.

The reduction of the material and personnel of the Navy has already begun to have its effect upon the amount of work thrown upon the corresponding civil establishments, and a considerable decrease in the staff has been effected.

Home.

The following is a comparison of the numbers employed on the 11th November, 1918, and 1st November, 1919:

	11 Nov. 1918.	1 Nov. 1919.
(*a*) Office staff:		
Men	6,615	6,031
Women	3,205	1,692
Total	9,820	7,723
(*b*) Industrial staff	105,024	85,832

The victualing depot at Grangemouth and the naval gun factory at Westhoughton have been closed; the naval yard at Invergordon, the torpedo depot at Harwich, the mining depots at Immingham and Lyness, and the naval ammunition factory at Alexandria, are in process of closing. Commercial premises at Grangemouth which had been requisitioned for the purposes of a mining depot have been surrendered.

As regards the dockyards, th volume of refitting and reconditioning work to be performed required for a time the retention of almost the full numbers employed during the war. The Admiralty have also adopted the policy of diverting to the dockyards the work of completing ships under construction in private yards which still require a considerable amount of work but are too far finished to be canceled, thus facilitating the output of merchant shipbuilding in the private yards.

The point, however, was reached in the autumn when the diminished amount of naval work falling upon the dockyards made it necessary to begin to reduce the numbers of workpeople employed to something approaching prewar numbers. A scheme of gradual reduction was therefore arranged for, under which discharges at the average rate of 800 work people would for the present be made weekly from the home dockyards as a whole. It was believed that this gradual rate of reduction would enable the bulk of the men affected to find employment in the merchant shipbuilding centers where the supply of labor is stated to be inadequate. During November it appeared that this expectation was not being fully realized, and the whole question is now receiving the most careful consideration with the object of alleviating the situation as much as possible.

A committee has been set up under the presidency of Lord Colwyn, and including representatives of the Government, the workpeople and the localities concerned, to investigate the possibility of utilizing for commercial purposes such part of the building and repairing

facilities at the yards as are not required for naval work in the immediate future, and it is hoped that the advice received from this committee will be of considerable assistance to the Admiralty.

Foreign.

At the time of the armistice some 19,400 were employed in these establishments, and a reduction of between 3,500 and 4,000 had been effected by the end of October, 1919, while discharges are still proceeding.

Admiralty Office Personnel.

The reduction in the Admiralty staff made between the 11th November, 1918, and the 1st November, 1919, was as follows:

	11 Nov. 1918.	1 Nov. 1919.
Men	6,065	5,554
Women	4,572	2,907
Total	10,637	8,461

The process of reduction will continue steadily, but it must be borne in mind that for the time being the work of the department has been considerably augmented in various drections as a result of demobilization. The following are instances of the additional work devolving upon the staff:

Issue of war gratuities to naval officers and men to the amount of £11,500,000.

Revision of rates of pay of all officers and men and payment of arrears consequent on the antedating of new schemes.

Preparation of rolls for issue of prize money.

Preparation of rolls for award of war medals and clasps.

The staff required for these temporary purposes to some extent neutralizes the large reductions made in other directions.

Naval Staff Organization.

At the outbreak of the war, both the development of the naval staff organization and the provision of more adequate means of training officers for naval staff work were receiving close attention.

The experience of the war has not only provided confirmation, if any were needed, of the great importance of these two subjects, but has also made it easier to decide what are the best lines to follow in dealing with them.

As regards the naval staff organization, it is intended that this shall comprise eight directorates, viz, plans, operations, local defense, communicatons, intelligence, trade, gunnery and torpedo, and training and staff duties.

At the armistice the number of officers in the naval staff was 336. This had been reduced by October, 1919, to 170, and it is estimated that a reduction to 120 can be effected by the end of the year. It is possible that the complement may be still further reduced when some of the pressing problems arising out of the war have been dealt with, but an adequate and well-organized naval staff must consist of considerably larger numbers than were included in the embryonic war staff that existed before the war.

Two years before the war a course of training for war staff officers had been instituted at the war college; but on June 4, 1919, a separate naval staff college was opened at Greenwich. The course lasts for 12 months, and there are at present taking it 16 naval, 2 military, and 2 air force officers. So far as can be judged at the present stage it promises to prove of great benefit, not only to the navy directly, but also in furtherance of the cooperation between the services.

On the first inception of a staff college the course must be tentative, and it may take a few years before it assumes a definite form; much must depend upon the practical results of the course, as shown by the subsequent staff work of those officers who will pass through the college during the first few sessions.

The war college, which is a separate institution, devoted to the higher naval education of more senior officers, will be reopened early next year.

In addition an introductory war course has been included in the syllabus for junior officers at Cambridge. It is hoped to continue this course in the future, as it is very desirable that those officers who have a bent for naval staff work should both "find themselves" and become known to the admiralty at an early stage.

Scientific Research.

The Admiralty have since the armistice given close attention to the question of the provision or supply of experimental types of newly-designed material, and to the policy to be adopted in regard to research for naval purposes.

A scientific adviser to the admiralty was appointed in the latter part of the war, and the post will be placed on a permanent footing under the title of director of scientific research. The officer holding this position will maintain the closest possible touch with all outside institutions and scientific bodies which are investigating problems in pure or applied research having a more or less direct bearing on possible naval requirements. This should assist in preventing waste of effort and money in undertaking experimental research work which is already in progress elsewhere.

Naval Forces of India and the Dominions.

At the request of the Governments of India and the Dominions, Admiral of the Fleet Viscount Jellicoe is engaged on a tour of the Empire in H. M. S. *New Zealand.*

Lord Jellicoe is reporting to each Government his recommendations for the reorganization and development of the local naval forces. The views of the various Governments on these reports must be ascertained and discussed with them before a naval policy for all parts of the empire can be formulated.

In the meantime the Dominion Governments have been asked whether they wish to have any vessels that are on the admiralty list of ships for disposal, in addition to the following ships which have been already allocated:

AUSTRALIA.

Submarine flotilla	Platypus (Depot ship) and J1, J2, J3, J4, J5, J7.
Flotilla leader	Anzac.
T. B. D.'s	Stalwart,[1] Success,[1] Swordman, Tasmania,[1] Tattoo.[1]
Sloops (mine sweeping)	Geranium, Mallow, Marguerite.

Canada.

Submarines	H14, H15.

LOSSES OF H. M. SHIPS (INCLUDING CERTAIN AUXILIARY VESSELS), 11TH NOVEMBER 1918—11TH NOVEMBER 1919.

Classification and name.	Date.	Place.	Cause of loss.
Cruiser:			
Cochrane	28 Nov. 1918	On passage from Scapa to Liverpool.	Ashore.
Light cruiser monitors:			
Cassandra	5 Dec. 1918	Baltic	Mined.
M. 25	17 Sept. 1919	North Russia	Demolished.
M. 27	17 Sept. 1919	do	Do.
Sloops:			
Gentian	16 July 1919	Baltic	Mined.
Myrtle	16 July 1919	do	Do.
Destroyers:			
Vittoria	1 Jan. 1919	do	Torpedoed by submarine.
Verulan	4 Sept. 1919	do	Mined.

[1] Temporarily in reserve in England.

LOSSES OF H. M. SHIPS (INCLUDING CERTAIN AUXILIARY VESSELS), 11TH NOVEMBER 1918—11TH NOVEMBER 1919—Continued.

Classification and name.	Date.	Place.	Cause of loss.
Minesweepers:			
Erin Isle	7 Feb. 1919	Off Nore	Mined.
Cupar	5 May 1919	North Sea	Do.
Kinross	16 June 1919	Ægean	Do.
Sword Dance	24 June, 1919	White Sea	Do.
Duchess of Richmond	26 June, 1919	Ægean	Do.
Fandango	3 July, 1919	White Sea	Do.
Princess Mary II	2 Aug., 1919	Ægean	Mined and beached.
Submarines:			
G. II	22 Nov., 1918	Howick	Wrecked.
L. 55	([1])	Baltic	Missing.
Yachts:			
Goissa	15 Nov., 1918	Dardanelles	Mined.
Iolaire	1 Jan., 1919	Stornoway	Wrecked.
Trawlers:			
Nodzu	1 Jan., 1919	Off Nash Point (British Channel).	Do.
Glenboyne	4 Jan., 1919	North Foreland	Mined.
Frostaxe	30 Apr., 1919	Off Owners Light Vessel.	In collison.
Steamaxe	1 Nov., 1919	South of Inchkeith.	Wrecked.
Drifters:			
I. and J	1 Jan., 1919	Newhaven	Do.
John Robert	1 Fev., 1919	En route Messina to Alexandretta.	Presumed mined.
Philorth	24 Feb., 1919	En route Syra to Malta.	Foundered.
London County	28 Oct. 1919	North of Beadnell.	Wrecked.
Motor launches:			
M. L. 121	22 Dec., 1918	Seine Bank	Foundered after collison.
M. L. 566	22 Dec., 1918	Off Cape Barfleur	Swamped and abandoned.
M. L. 18	29 Sept., 1919	On passage from Norway.	Abandoned derelict and sunk.
M. L. 62	29 Sept., 1919		
M. L. 191	29 Sept., 1919		
Coastal motor boats:			
24 A	18 Aug., 1919	Baltic	Lost in attack on Bolshevik Fleet at Kronstadt.
79 A	18 Aug. 1919		
62 BD	18 Aug. 1919		
67 A	18 Aug. 1919		
Mercantile fleet auxiliary:			
Race Fisher	31 Jan., 1919	Stratoni	Wrecked and abandoned (hulk sold).
Store carrier:			
Volturnus	1 Nov., 1919	Near the Skaw	Mined.
Hospital carriers:			
Edinburgh Castle	24 Sept., 1919	North Russia	Demolished.
Lord Morton	24 Sept., 1919		

[1] Missing since 4 June, 1919.

STATISTICAL TABLES RELATING TO THE PERIOD OF THE WAR.

1. *Numbers of H. M. ships at the outbreak of war and at date of the armistice.*

[Ships in the naval service of Dominion Governments are included.]

Description.	14 Aug., 1914.		11 Nov., 1918.	
	Number.	Displacement tonnage.	Number.	Displacement tonnage (gross tonnage in *italics* is additional).
WARSHIPS.				
Battleships:				
Dreadnoughts	[1] 20	423,350	33	775,850
Predreadnoughts	40	589,385	[2] 17	258,900
Total	60	1,012,735	50	1,034,750
Battle cruisers	9	187,800	9	206,300
Cruisers	46	510,650	[3] 27	304,950
Light cruisers	62	260,100	[4] 82	344,330
Gunboats	28	16,641	52	22,784
Coast-defense vessels	.....	.....	1	5,700
Monitors	.....	.....	33	106,130
Sloops	11	11,330	11	11,738
Fleet-sweeping vessels (sloops)	.....	.....	106	132,800
Flotilla leaders	1	2,207	26	42,634
Torpedo-boat destroyers	215	142,546	407	363,695
Torpedo boats	106	17,906	94	15,831
Submarines	76	30,983	137	131,658
Aircraft carriers	1	5,600	13	79,077 *5,375*
P. and P. C. boats	.....	.....	62	38,932
Mine-laying vessels	7	24,200	8	52,800 *4,298*
Repair ships	2	20,900	7	38,458 *1,219*
Depot ships	22	86,845	49	312,728
Armed merchant cruisers	([5])	.....	29	*297,968*
Armed boarding steamers	.....	.....	20	*32,617*
Special-service ships	.....	.....	50	*25,000*
Coastal motor boats	.....	.....	66	545
Miscellaneous	2	2,780	15	1,288 *16,361*
Total warships	648	2,333,223	1,354	3,247,078 *382,838*

[1] One newly commissioned 7 Aug., 1914, not included.
[2] Excluding 12 predreadnought battleships.
[3] Excluding 10 cruisers.
[4] Excluding 10 light cruisers.
[5] Several fitting out at this date.

} Converted from their original type to depot ships, etc.

STATISTICAL TABLES RELATING TO THE PERIOD OF THE WAR—Continued.

1. *Numbers of H. M. ships at the outbreak of war and at date of the armistice*—Continued.

[Ships in the naval service of Dominion Governments are included.]

Description.	14 Aug., 1914.		11 Nov., 1918.	
	Number.	Displacement tonnage.	Number.	Displacement tonnage (gross tonnage in *italics* is additional).
AUXILIARY PATROL SERVICE.				
Yachts	.....	.....	57	[1] *37,000*
Patrol gunboats	.....	.....	30	20,724
Whalers	.....	5,667	18	4,704
Trawlers	12	.....	1,520	[1] *350,000*
Drifters	.....	.....	1,365	[1] *113,000*
Mine sweepers—Paddle or screw	.....	.....	156	68,645 *37,600*
Motor launches	.....	.....	507	18,252
Motor drifters and motor boats	.....	.....	74	[1] *5,300*
Total auxiliary patrol service	12	5,667	3,727	118,325 [1] *542,900*
Grand total	660	2,338,890	5,081	3,365,403 [1] *925,738*

[1] Approximate.

OTHER AUXILIARY VESSELS.

In addition to the above the principal auxiliary vessels employed on admiralty service included—

	4 Aug., 1914.	11 Nov., 1918.
Commissioned escort ships	.....	9
Squadron supply ships	(1)	.....
Flotilla supply ships	(1)	.....
Colliers	65	283
Oilers	32	225
Store ships	.....	8
Frozen-meat ship	(1)	4
Officers' mess ship	.....	1
Mine carriers	(1)	4
Ammunition ships and carriers	.....	27
Hospital ships	(1)	9
Total	97	570

[1] Several fitting out at this date.

H. M. SHIPS AND AUXILIARY VESSELS COMPLETED BETWEEN 4 AUG. 1914, AND 11 NOV, 1918.

[(A.)—Tonnage completed annually as compared with pre-war output.]

Period.	Approximate displacement (tonnage.)	
	Warships.	Auxiliaries.
Average for two years preceding the war	179,800	[1] 5,000
4 Aug., 1914, to 30 June, 1915	343,320	12,573
1 July, 1915, to 30 June, 1916	522,239	62,869
1 July, 1916, to 30 June, 1917	370,601	349,010
1 July, 1917, to 30 June, 1918	269,884	273,354
1 July, 1918, to 11 Nov., 1918	96,046	92,305
Total	1,602,090	754,111

[1] Estimated.

[(B.)—Number and tonnage of each type completed.]

Warships.	Number.	Approximate displacement (tonnage).
Battleships	[1] 15	394,750
Battle cruisers	3	81,500
Cruisers	3	56,300
Light cruisers	[2] 36	143,050
China gunboats	28	9,308
Coast defense vessels	[3] 2	11,400
Monitors	[4] 38	114,255
Sloops	124	155,430
Flotilla leaders	[5] 28	45,565
Torpedo-boat destroyers	[6] 255	272,895
Submarines	146	151,380
Aircraft carriers	[7] 8	67,457
P. and P. C. boats	63	39,957
Repair ships	[7] 2	9,538
Depot ships	[7] 8	48,645
Coastal motor boats	83	660
Total, H. M. ships	842	1,602,090

[1] Includes two purchased from Turkey and one purchased from Chile.
[2] Includes one built for Royal Australian Navy and two purchased from Hellenic Government.
[3] Purchased from Norwegian Government.
[4] Includes three purchased from Brazilian Government.
[5] Includes four purchased from Chilean Government.
[6] Includes one purchased from the Portuguese Government, four purchased from the Hellenic Government, three ex-Turkish vessels, and three built for the Royal Australian Navy.
[7] Includes merchant vessels purchased and reconstructed.

H. M. SHIPS AND AUXILIARY VESSELS COMPLETED BETWEEN AUG. 4, 1914, AND NOV. 11, 1918—Continued.

(B) Number and tonnage of each type completed.

Auxiliary vessels.	Number.	Approximate displacement (tonnage).
Patrol gunboats	30	26,727
Whalers	15	5,040
Trawlers	282	151,422
Drifters	85	16,777
Paddle mine sweepers	34	27,422
Twin-screw mine sweepers	55	43,000
Tunnel mine sweepers	10	2,825
Boom defense vessels	32	9,300
Coast guard cruiser	1	883
Oilers	64	432,987
Petrol carriers	3	3,072
Water carriers	1	12,788
Tugs	23	15,280
Salvage vessels	2	1,200
Mooring vessels	6	4,548
Seaplane towing lighters	28	840
Total auxiliary vessels	671	754,111
Grand total H. M. ships and auxiliary vessels	1,513	2,356,201

Of the vessels shown in Table B at the outbreak of war, excluding warships under construction for foreign powers subsequently taken over for the Royal Navy, there were on order or laid down:

Battleships	12	Submarines	25
Battle cruisers	3	Aircraft carriers	1
Light cruisers	17	Depot ships	1
Flotilla leaders	4	Coast guard cruisers	1
Torpedo boat destroyers	18	Oilers	1

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LOSSES OF H. M. SHIPS FROM ALL CAUSES BETWEEN AUG. 4, 1914, AND NOV. 11, 1918

Class.	Total number lost.	Total displacement tonnage lost (gross tonnage in *italics* is additional).
		Tons.
Battleships	13	200,735
Battle cruisers	3	63,000
Cruisers	13	158,300
Light cruisers	[1] 12	46,255
Gunboats and torpedo gunboats	5	4,235
River gunboats	2	([2])
Coast defense ships	1	5,700
Monitors	5	8,125
Sloops	18	22,630
Flotilla leaders	3	5,204
Torpedo boat destroyers	64	52,045
Torpedo boats	11	2,230
Submarines	[3] 54	43,649
Aircraft carriers	3	27,488
Patrol boats	2	1,226
Mine layers	2	11,000 *6,000*
Armed merchant cruisers	17	*179,169*
Armed boarding steamers	13	*23,779*
Coastal motor boats	13	85
Total	223 *31*	[2] 651,907 *208,948*

[1] Including six light cruisers sunk as blockships at Zeebrugge and Ostend.
[2] River gunboats Comet and Shaitan, tonnage uncertain.
[3] Including seven submarines destroyed at Helsingfors to avoid capture, and one blown up at Zeebrugge Mole.

LOSSES OF AUXILIARY VESSELS ON ADMIRALTY SERVICE.

Class.	Total number lost.	Total tonnage lost (gross tonnage in *italics*, displacement tonnage in ordinary type).
		Tons.
Hospital ships	2	*15,199*
Frozen meat ships	1	*1,730*
Store carriers	4	*4,770*
Ammunition ship	1	*2,030*
Mine carriers	2	*4,496*
Mine sweepers	5	*3,990*
	13	*7,758*
Auxiliary patrol paddlers	2	*679*
Fleet messengers	9	*11,602*
Commissioned escort ships	3	*22,082*
Miscellaneous	3	*4,698*
Colliers	244	*714,613*
Oilers	44	*216,445*
Special service ships	29	[1] *35,760*
Tugs	14	*3,593*
Yachts	13	*7,179*
Whalers	2	*347*
Admiralty trawlers	18	*4,719*
Hired trawlers	246	*56,300*
Hired drifters	130	*10,809*
Motor launches	24	*864*
Motor boats	6	[1] *61*
Total	5	3,990
	810	[1] *1,125,743*

[1] Excluding 2 motor boats and 2 special service ships whose tonnage is uncertain.

STATEMENT SHOWING NUMBERS BORNE IN H. M. FLEET.

	15 July, 1914.	15 Aug., 1914.	15 Nov., 1918.
Royal Navy, Royal Marines, etc. (other than retired, pensioners, or reserves)	146,047	147,667	188,537
Entered for hostilities only	.....	.....	74,437
Retired officers and pensioners	.....	6,970	12,346
Royal Fleet Reserve	.....	27,395	19,180
Royal Naval Reserve	.....	13,510	23,453
Royal Naval Reserve (trawler section)	.....	3,130	37,145
Royal Naval Volunteer Reserve	.....	2,345	50,218
Colonial Reserves	.....	.....	2,000
Total	[1] 146,047	[1] 201,017	[2] 407,316

[1] R. N. A. S. included.
[2] R. N. Division included, but M. M. Reserve excluded.

	15 July, 1914, to 15 Nov., 1918.
Expansion of naval personnel:	
(*a*) Gross	261,269
(*b*) Net (i. e., making allowance for 63,842 officers and men in reserve branches, not mobilized in July, 1914)	197,427

	15 July, 1914.	15 Nov., 1918.
Women's Royal Naval Service	0	4,821
R. N. A. S.	729	[1] 55,066

[1] The R. N. A. S. was transferred to the R. A. F. on 1 Apr., 1918.

Coast-watching service (maximum numbers):

Civilian watchers	2,400
Boy Scouts	1,700

STATEMENT SHOWING THE NUMBER OF CASUALTIES IN THE ROYAL NAVY (EXCLUDING R. N. DIVISION, BUT INCLUDING R. N. AIR SERVICE TO 31ST MARCH, 1918) FROM 4TH AUGUST, 1914, TO 11TH NOVEMBER, 1918.

	Officers.	Men.	Total.
Killed in action (including died of wounds)	2,059	20,148	22,207
Died from other causes	394	10,926	11,320
Wounded in action	805	4,072	4,877
Wounded, not in action	.....	313	313
Prisoners of war	179	726	905
Interned	44	227	271
Missing	15	32	47
	3,496	36,444	39,940

STATEMENT SHOWING THE NUMBER OF CASUALTIES IN THE ROYAL NAVAL DIVISION FROM 4TH AUGUST, 1914, TO 11TH NOVEMBER, 1918.

	Officers.	Men.	Total.
Killed in action (including died of wounds)	439	7,298	7,737
Died from other causes	12	456	468
Wounded in action	777	19,373	20,150
Prisoners of war	60	2,844	2,904
Interned	37	1,577	1,614
Missing	6	181	187
	1,331	31,729	33,060

MEDICAL STATISTICS.

	July, 1914.	Nov., 1918.
Medical officers, R. N., R. N. V. R., etc.	555	1,771
Sick berth staff, including R. N. A. S. B. R.	1,503	4,057
Nursing sisters	70	297
V. A. D.'s	.....	534
	2,128	6,659

Cases treated in naval hospitals	348,386
Cases treated in naval hospital ships	82,561
Cases carried by naval medical transport (trains)	74,572

TRANSPORTATION BY SEA. STATEMENT OF PERSONNEL, ANIMALS, VEHICLES, ETC., TRANSPORTED BY MILITARY SEA TRANSPORT, AUGUST, 1914, TO 30TH NOVEMBER, 1918.

Personnel, effectives		20,778,671
Personnel, noneffectives		2,927,143
Prisoners		158,861
Animals		2,240,495
Vehicles		506,486
British military stores	tons	46,502,486
Allied stores of all kinds	do	4,535,679

NUMBER OF PERSONS OTHER THAN THOSE IN DIRECT GOVERNMENT SERVICES ENGAGED IN MANUFACTURING AND SUPPLYING NAVAL EQUIPMENT, NAVAL ORDNANCE, NAVAL STORES, ETC., AND ENGAGED ON NAVAL CONSTRUCTION AND REPAIR OF MERCHANT VESSELS.

	Number employed, 1918.
Naval construction in private yards	140,000
Naval repairs in private yards	50,000
Merchant vessels—repairs in private yards	64,000
Admiralty "A" firms (i. e., those engaged to the extent of 75 per cent of their total work on Admiralty manufactures, etc.)	154,000
Total	408,000

NAVAL ORDNANCE, TORPEDO, MINING, AND ANTI-SUBMARINE EQUIPMENTS, FUEL AND STORES.

GUNS MOUNTED FOR NAVAL SERVICE.

At—	Heavy.						Medium, 7.5-inch to 4-inch.	Light, below 4-inch.	Total.
	15-inch.	14-inch.	13.5 inch.	12-inch.	10-inch.	9.2-inch.			
4 Aug., 1914	.....	.....	144	300	8	142	2,845	3,673	7,112
31 Oct., 1918	106	16	148	240	.....	94	5,579	8,541	14,724

GUNS AND MOUNTINGS ISSUED 4TH AUGUST, 1914, TO 31ST OCTOBER, 1918.

To—	Heavy, 9.2-inch and above.	Medium, 7.5-inch to 4-inch.	Light, below 4-inch.
H. M. ships [1]	432	3,821	3,469
Auxiliary patrols	.....	422	5,410
Defensively armed merchant ships	.....	3,323	3,800
Allies	11	80	738

[1] The figures for H. M. ships relate to guns only, and include purchases for reserve.

TORPEDOES AND TORPEDO EQUIPMENT OF SHIPS.

TORPEDOES.	Number.
For British Naval Forces	11,060
For Air Service	607
Total	11,667
For Allied Naval Forces	322

TORPEDO EQUIPMENT.	Number.
Torpedo tubes	3,618
Air compressors	722
Steel reservoir bottles	12,487

MINES, DEPTH CHARGES.

	For British naval forces.	For Allies.
Mines of all types	221,140	257
Depth charges	96,403	5,256

PARAVANES (MANUFACTURED FOR BRITISH NAVY ONLY).

	Number.
Mine cutting	6,155
Explosive	2,456
Total	8,611

MINE SWEEPING ROPE.

Rough estimate of mine sweeping rope expended; 8,825,500 fathoms.

SEARCHLIGHT EQUIPMENT.

Provision was made for—

(1) Eight hundred and sixty-four searchlight equipment sets of a new type, and for 330 existing sets to be improved.

(2) Three thousand seven hundred and ten searchlight projectors for auxiliary craft and for signalling purposes.

NAVAL STORES (GENERAL).

The total money expenditure during the war on naval stores (excluding fuel) for maintenance of fleet and construction and repairs in royal dock yards was approximately £54,000,000, while that for naval stores (excluding fuel) supplied to the Allies was approximately £5,640,000.

VICTUALLING STORES (PROVISIONS, CLOTHING, AND MESS GEAR).

The total approximate money expenditure during the war was as follows:

For the Service of the Fleet	£45,000,000
Supplied to the Allies	800,000

FUEL.

COAL.

The following figures represent the approximate amounts of coal shipped under Admiralty directions, or railed to the East Coast during the war:

(1) Shipped for His Majesty's ships, dockyards, transport, and commercial vessels at home and abroad:		
(*a*) British coal	tons	36,000,000
(*b*) Coal from India, South Africa, etc	do	1,250,000
(2) Dispatched by rail, principally to east coast bases	do	6,300,000
(3) Shipped for British Expeditionary Force	do	2,950,000
(4) Shipped for Allies prior to establishment of ministry of shipping	tons	7,500,000
		54,000,000

The maximum number of colliers employed at any one time by the Admiralty for all services was		563
Aggregate carrying capacity of about	tons	2,147,000
The average number employed in home waters was about		200
Carrying capacity	tons	470,000

Apart from meeting naval and transport needs the Admiralty undertook the responsibilities throughout for coal supplies to the British Expeditionary Force, for the United States Navy in British and Mediterranean waters, and also, until the establishment of the ministry of shipping, for the French and Italian marine, the French State railways, and other services. The unavoidable dislocation of the bunkering trade necessitated provision being also made by the Navy for the bunkering of British commercial and allied transports and other vessels.

OIL FUEL.

	Tons.
The total amount of oil brought to British bases throughout the war exceeded	10,000,000
Supplies derived from home sources	350,000
Issues to the fleet	9,100,000
Issues to Allies (excluding U. S. Navy)	500,000
In addition American naval tankers imported	560,000
Distributed coastwise by small British craft to United States naval units.	

Owing to the rapid increase in the oil-burning fleet and the high standard of consumption resulting from the antisubmarine campaign, convoy and escort systems, etc., the oil expenditure of 1914 had practically quadrupled four years later.

The available tankers being inadequate to cope either with the import requirements or with the need for fleet auxiliaries, a large building program was projected in the early stages of the war and

subsequently amplified. This program resulted in the following additions to the oil-carrying fleet:

	Number.	Carrying capacity.
		Tons.
Cargo tankers	52	380,000
Fleet auxiliaries	49	96,000

The inadequacy of the supply of tankers and the large number of casualties to vessels en route, necessitated supplementing tanker imports from 1917 onwards by the use of double bottoms of cargo steamers.

Deliveries by this method amounted to 1,100,000 tons.

Petrol.

The great extension of the naval air service and the introduction of petrol-burning motor launches, coastal motor boats, and motor transport created an exceedingly high demand for petrol for naval purposes. To meet requirements petrol installations were set up at numerous points round the coast of Great Britain and at certain stations abroad; supplies being regulated by rail or coastal transport.

WORKS, NEW BUILDINGS, DEFENSES, ETC.

The total expenditure incurred under the above heading during the war was £23,737,000.

(2) The principal items were—

Improvements at naval and repair bases	£3,698,000
Naval air stations	6,082,000
Defenses against submarine attack	3,179,000
Cordite factory	2,123,000

JAPANESE NAVAL MANEUVERS.

Source: Reliable.

(11861)

19 November, 1919.

Japanese grand naval maneuvers were held during the period from the 11th to the 26th October, 1919. The Japanese navy department announced that 94 ships of various classes took part in the maneuvers.

The ships which took part in the maneuvers for the first time were as follows:

Ise superdreadnought.

Hyuga, superdreadnought.

Tatsuta, light cruiser.
Kuwa, destroyer.
Tsubaki, destroyer.
Maki, destroyer.
Submarine *No. 15.*
Submarine *No. 16.*
Submarine *No. 17.*
Submarine *No. 19.*
Submarine *No. 20.*

The three standing squadrons and all ships of the first reserve took part in the maneuvers.

The forces were divided into two units: Red (defense), Vice Admiral Kuroi; Green (attack), Admiral Yamashita.

The Red forces consisted of the third standing squadron as a nucleus and had the assistance of the Yokosuka and Kure naval stations.

The Red forces were composed of the following ships:

Predreadnoughts:
- Katori.
- Mikasa.
- Asahi.
- Shikishima.
- Ibuki.
- Kurama.
- Ikama.

Coast defense battleship:
- Fuji.

Ninth destroyer division:
- Oite.
- Yayoi.
- Hayate.
- Yokagi.

Thirty-first destroyer division:
- Wakaba.
- Asakaze.
- Nenochi.
- Ushio.

Seventh destroyer division:
- Kisaragi.
- Hatsushimo.

Cruisers:
- Iwate.
- Chitose.
- Tone.
- Tsushima.
- Mogami.[1]
- Akitsushima.
- Chihaya.

Eleventh destroyer division:
- Hatsuyuki.
- Shigure.
- Hatsuhara.
- Harukaze.

Thirteenth destroyer division:
- Udzuki.
- Manatsuki.
- Nagatsuki.
- Kikusuki.

Twelfth destroyer division:
- Uranami.
- Isonami.
- Ayanami.

Three coal supply ships.

The ships belonging to the Green (attacking forces) under Admiral Yamashita were:

Superdreadnoughts:
- Yamashiro (flag).
- Hyuga.
- Ise.
- Fuso.

Predreadnoughts:
- Kajima.
- Aki.
- Satsuma.

[1] Despatch vessel.

Battle cruisers:
- Haruna (flag).
- Hiyei.
- Kirishima.
- Kongo.

Dreadnaught:
- Settsu.

Cruisers:
- Tokiwa (flag).
- Adzuma.
- Idzumo.
- Asama.
- Akashi.
- Chikuma.
- Tatsuta (flag—first torpedo flotilla).
- Hirado (flag—second torpedo division).
- Aso (flag—fourth torpedo division).

Destroyers:
- Hamakaze.
- Isokaze.
- Amatsukaze.
- Tanikaze.
- Kawamaze.
- Naba.
- Enoki.
- Nara.
- Umikaze.
- Keyaki.
- Kuwa.
- Tsubaki.
- Maki.
- Sukura.
- Tachibana.
- Kiri.

Mother ships of aeroplanes:
- Komabashi.
- Wakamiya.

Submarine tender:
- Karasaki.

Ten submarines and a few special duty vessels.

The maneuvers were managed by the Department of the Resident General. Admiral Shimomura, Chief of the Naval General Staff, was the head of this department. Vice Admiral Arima, Adjutant General, Rear Admiral Abo, Chief of Staff, and 26 other officers assisted.

Force inspectors were assigned to the Green and Red forces, as follows:

Green.	*Red.*
Admiral Murakami.	Vice Admiral T. Sato.
H. I. H. Vice Admiral Prince Hiroyasu.	Rear Admiral Nakano.
Vice Admiral Suzuki.	Rear Admiral Takeuchi.
Rear Admiral Shimomura.	Admiral Baron S. Kato.
	Rear Admiral Nakazato.

The maneuvers were divided into three periods: Primary, strategical, and tactical.

General instructions were given to both Red and Green and secret instructions were given to each. The Red forces were based on an island between Kure and Yokosuka. The Green forces were to come from the south and attempt to capture Kure or Yokosuka. Each force was provided with an aviation corps and with submarines. There was a third aeroplane corps at Yokosuka for its defense. No German submarines were used during the maneuvers.

After the preliminary drills the Green (attack) force went to Amami, Oshima, Kagoshima Prefecture, and the Red (defense) force to Tokuyama Harbor where they took on provisions.

The naval stations prepared for war, getting batteries into position and bringing up supplies for the stations and for the ships attached to them.

During the first period of the maneuvers the Green squadron exercised in the Seto Inland Sea and on the south shore of Shikoku. The Red squadron did the same on the south and west shores of Kyushu and the naval station forces exercised in their own waters.

During this period units were reorganized and preliminary drills called for by this reorganization were held.

The Green force, under Admiral Yamashita, blocked the mouth of Tokyo Bay on the night of the 13th by laying mines across the entrance. They were guarded by areoplanes and submarines during the operations. Early in the morning of the 14th the Yokosuka naval station swept the mouth of the bay.

On the evening of the 14th at 7 o'clock two aeroplanes of the invading (Green) force appeared at a height of 1,500 meters at the mouth of Tokyo Bay. Four searchlights at the naval port which were on watch found them at once and reported it to all defending bases. In a short time one of the enemy planes began dropping bombs on the naval ordnance building of the Nagaura Defense Corps and the other began to attack the naval station and the marines' division. A Sopwith machine was sent over from the aviation squadron at Oppama to attack the two enemy planes, and after they had made observations of the defense by using star shells they fled to their base. The exercise closed at 7.30.

On the night of the 15th enemy flying machines again appeared from the enemy's direction.

On the 14th of October, the last day of the first period of the maneuvers, the sea detachment of the Kure naval station made an attack against the invading force. The *Kurokami Maru*, the *Kure Maru, 5th*, and several other ships on special duty with the attacking force, after they had placed mines in the way of the enemy and laid down dummy periscopes, waited until 6 o'clock in the evening. Then they made a counterattack on the enemy ship *Suwo* (coast defense battleship) and began close fighting. The suspension order was given by Admiral Saito. This was the end of the first of the maneuvers.

The Second Period.

(Strategical.)

On the 15th of October the military review of the land detachment was held. As the Navy entered into the second period on the 16th the whole Imperial Navy made preparations for battle, which was held on the sea between the Tsugaru Straits and the Formosa Channel. The main force of the Green force gathered in Tosa Bay and made plans for the attack by sending scout ships to all three naval stations, Yokosuka, Kure, and Sasebo. On the other hand,

the main force of the Red side gathered on the sea near Kagoshima and tried to check the Green force by searching out the plans and condition of the enemy.

During the second period extensive strategic exercises were held in the eastern sea of Honshu and the Pacific Ocean.

After the conclusion of the first period of maneuvers the whole invading first squadron (with the *Yamashiro* under command of Admiral Tamashita) and the second squadron (with the *Haruha*), which were lying at Saheki Bay, started on the night of the 16th instant for the northeastern part of Formosa. The defending force, the third squadron, and the reserve ships of each naval station, which were lying at Satsukawa Bay, set out for the south shore of Kyushu on the same night, and the *Manshu*, the resident general on board, went out in the same way from Keniya Bay. Thus on the 17th at 5 o'clock in the morning the second period of the strategic exercises was opened. At the same time with the opening of the second period the Yokosuka naval station, which belonged to the defending force, sent out a landing party to scout around the city.

On the 17th of October the attacking force entered Ise Bay at night, holding preparatory drills along the way.

As soon as the telephone order for the opening of the second period of the maneuvers was given by the *Manshu*, the Yokosuka, Kure, Sasebo, and Maizuru naval stations got into action with the main defending squadrons to confront the invading squadrons which were expected in from the Pacific Ocean.

Previously Admiral Hawa, commander in chief of the Yokosuka naval station, Admiral Kato, of Kure, Vice Admiral Takarabe, of Sasebo, and Vice Admiral Nomagushi, of Maizuru, held defense drill at their respective naval ports, and placed in position the destroyers and reserve ships.

The navy aviation squadron at Oppama made preparations for the attack by bringing out 3 aeroplanes of 300 horsepower and about 10 Sopwith machines.

The invading force gathered at their base in the Pacific on the morning of the 17th. The first and second squadrons, the first and second torpedo squadrons, and the first submarine squadron were sent out on scouting duty.

The director of the maneuvers, Admiral Shimomura, on board the *Manshu*, set out from Kure on the 17th to direct the second period.

On that day N. I. N. Admiral Prince Fushimi was on the *Haruna* as judge, and Second Sublieutenant Fushimi and Second Sublieutenant Yamashina took part with the invading forces on the *Kimishima* and *Hiei*.

Aeroplanes were used by each side for scouting purposes.

The defending force started for Tokyo Bay from the east side of Amami Oshima.

During the night of the 17th the commander in chief of the attacking force attempted to find the plans of the enemy, but was unsuccessful and had to wait for morning.

A detachment of the defending force tried to make its way through the Bungo Straits but was met by a detachment of the Green force and severe fighting continued all night (the 17th).

On the 18th the main force of the defense advanced to the east in an attempt to reach Tokyo Bay. They were found, however, by the enemy planes, and the commander of that attacking force sent the submarine division to the offing of Suruga Bay and the aviation mother-ship squadron to Enshu Channel to meet the enemy the next morning. However, at 3 o'clock that afternoon the attack ran into the defense force and a short battle ensued. The commander of the defense then decided to change his route and going to the northwest tried to attack the weak portion of the attacking force. The main force of the attack then returned to Enshu Channel to meet the enemy in the morning of the 19th. The torpedo divisions kept the enemy busy during the night. During the night the *Katori* was declared sunk and some damage done to the destroyers.

On the 19th the defense force advanced in war formation against the attacking force. At 6.50 they encountered the enemy and a battle began. During the battle the torpedo divisions were extremely active, attacking each other's main force.

At 7.30 at the height of the battle the order was given to close the second period of the maneuvers.

The Third Period.

(Tactical.)

During the third period the sea to the south of Honshu was the scene of operations.

H. I. M. the Emperor was afloat during the third period on board the *Settsu.*

The third period was opened on the 23d with the Green force at Boshu and the Red force at a point east of Miyajima.

About 12.30 p. m. the leading ship of each force came in sight of each other. The weather was bad, a slight rain falling.

Aeroplanes were sent out on scouting duty, and at 2.30 p. m. an engagement took place. The exercise was discontinued at 3.45.

Early in the morning of the 24th the *Settsu*, with the Emperor on board, advanced to Shirmoshima, Chiba Prefecture, and gave the order to open battle. Both forces opened heavy fire.

The battle lasted about two hours.

During the 25th and 26th the two forces kept up heavy fire, and when the order was given to conclude the third period all ships came into Yokohama Harbor for the naval review held 28 October.

MISCELLANEOUS.

BRITISH NAVAL ESTIMATES REVISED.

Source: Reliable.

(12490A.)

5 December, 1919.

£157,528,800.

275,000 Officers and Men.

The revised navy estimates are as follows for 1919–20. The net estimates are for £157,528,800, as compared with £149,200,000, the total of the original estimates presented last March. The estimates for 1914–15, the last year that opened in peace, were for £51,550,000. The original vote for officers and men last March allowed for a total strength of 280,000. This has now been reduced to 275,000 as compared with 151,000 in 1914–15.

The revised votes for money are as follows:

Effective Services.

1. Wages, etc., of officers, seamen, and boys, coast guard, royal marines, women's royal naval service, and mercantile officers and men	£33, 893, 800
2. Victualing and clothing for the navy	10, 008, 000
3. Medical establishments and services	629, 200
4. Civilians employed on fleet services	496, 000
5. Educational services	417, 500
6. Scientific services	463, 000
7. Royal naval reserves	459, 000
8. Shipbuilding, repairs, maintenance, etc.:	
Personnel	12, 008, 000
Matériel	10, 685, 700
Contract work	41, 855, 400
9. Naval armaments and aviation	15, 790, 100
10. Works, buildings, and repairs at home and abroad	5, 667, 700
11. Miscellaneous effective services	6, 106, 000
12. Admiralty office	1, 900, 000
Total	140, 379, 400

Noneffective Services.

13. Half pay and retired pay	1, 296, 600
14. Naval and marine pensions, gratuities, and compassionate allowances	15, 134, 000
15. Civil superannuation, compensation allowances, and gratuities	718, 800
Total	17, 149, 400
Grand total	157, 528, 800

The chief increase on the original estimates is in the wages vote, which has gone up from £26,000,000 to £33,893,800. Two of the three items for shipbuilding repairs, maintenance, etc., show a reduction but the vote for contract work has increased from £37,500,000 to £41,855,400. In the noneffective services, the vote for pensions, etc., has gone up from £10,625,000 to £15,134,000. The revised estimates were signed on 31 October, when Admiral Wemyss was still First Sea Lord. It is expected that they will be debated in the House of Commons next Monday.

The following statement shows the contributions received from India and the colonies toward naval expenditure.

India.	
Maintenance of His Majesty's ships in Indian waters	£100,000
Indian troop service (on account of work performed by the Admiralty	3,000
Dominion of Canada, Australian Commonwealth, Dominion of New Zealand.	
Contribution on account of liability for retired pay of officers and pensions of men lent from the royal navy	24,400
Dominion of New Zealand.	
General maintenance of the navy	25,000
Union of South Africa.	
General maintenance of the navy	85,000
Newfoundland.	
Maintenance of a branch of the royal naval reserve	3,000
Total	240,800

The program of the estimated expenditure for new construction is £25,647,781, divided between £1,500,408 for dockyard built ships, £22,353,525 for contract-built ships, and £1,793,848 for other vessels. Repairs absorb £21,353,124.

New Construction.

The following are the details of the chief items of the new conconstruction for which provision is made:

Light cruisers.—Effingham, *Frobisher*, and *Hawkins* (completed).

Battle cruisers.—Hood (estimated expenditure £5,148,069).

Light cruisers.—Calcutta and *Cairo* (completed), *Cape Town*, *Colombo*, and *Delhi* (completed), *Despatch*, *Diomede*, *Dunedin* (completed), *Durban*, *Emerald*, *Enterprise*, and *Raleigh*.

In addition there is a swarm of torpedo craft and submarines, mostly completed, together with 10 sloops, two ocean-going aircraft carriers, *Eagle* and *Hermes;* 37 patrol gunboats (of which 24 will be sold), 84 mine sweepers (of which 3 are to be for sale), and 6

surveying vessels. Of 400 trawlers in the program 150 are to be sold. Similarly, 124 out of 180 drifters are for sale. The last item in this formidable list of small craft are 59 boom-defense vessels, 89 tugs (24 for sale), and 7 mooring vessels.

Ships undergoing large repairs and alterations in dockyards at home include such famous warriors as *Warspite*, *Tiger*, *Renown*, *Repulse*, *Princess Royal*, *Antrim*, *Highflyer*, *Birmingham*, *Lowestoft*, and *Himalaya*, together with the royal yacht *Victoria and Albert*.

OIL ACTIVITIES IN CUBA.

Source: Reliable.

20 December, 1919.

The Texas Co. (South America) (Limited), last week began active construction of its initial fuel-oil tank at Antilla. The site selected is in the northeast part of the town, about 200 yards beyond that upon which the tank of the West India Sugar Finance Corporation is located and on the shore of the Nipe Bay. Fourteen carloads of construction materials purchased in the United States have already arrived and boilers and pumps are en route. Necessary lumber will be purchased in Antilla from an American lumber concern.

The tank will have a capacity of 64,000 barrels. It will be 35 feet high and 115 feet in diameter. Five thousand feet of pipe-line will be laid from the tank to the discharge wharf and will follow the general direction of the piping from the West India tank, terminating in the same dock. The pipe line will be 12 inches in diameter and have a 2-inch inner pipe for steam, to heat the oil and to facilitate pumping. A pump and boiler house of sheet iron and concrete will be constructed, size 28 by 36 feet. Ground has been broken for the erection of a six-room frame cottage with screened-in porch and modern conveniences, which will be occupied by the constructing engineer and later be used as dwelling and office of the resident manager. Fifty laborers, recruited locally, are employed. Cost of erection of tank, pumping station and pipe line is estimated at $15,000. It is estimated that the new tank will be ready for oil in February or March, 1920.

Other Tanks Constructed in Cuba.

It is of interest to note that the Texas Co. has established, or is establishing, tanks at several points in Cuba, as briefly outlined below:

Cienfuegos.—One tank, capacity 64,000 barrels, completed in October, 1919. Oil received. Land purchased for erection of a second tank, same capacity.

Antilla.—One tank, capacity 64,000 barrels, under construction. Land purchased for later erection of second tank, same capacity.

Nuevitas.—Land purchased for erection of two tanks, capacity of first to be 64,000 or 55,000 barrels. Work of construction about to start.

Isable de Sagua.—One tank, capacity 37,500 barrels, nearly completed and soon ready for oil. Land purchased for later erection of second tank.

Regla, near Habana.—Land purchased for erection of two tanks, each of 64,000 barrels capacity. Work to be started later.

Matanzas.—One tank, capacity 55,000 barrels, under construction and to be ready for oil in about six weeks. Land purchased for subsequent erection of second tank.

Santiago de Cuba.—Land purchased between city and El Cobre for construction of two tanks, first to be either 64,000 or 55,000 barrels capacity. Work to be started as soon as necessary railroad siding is built.

From the foregoing it may be observed that it is the policy of the Texas Co. to secure terrain for two tanks at all main points where fuel stations are established, even when the construction of but one tank is contemplated at the time of purchase, thus providing for expansion as business development warrants.

Growth of Oil Consumption.

The use of fuel oil is being extended rapidly. The United Railways of Habana are said to be engaged in changing 35 locomotives to oil burners and a similar step is said to be contemplated by the Cuba Railroad Co. which latter operates in this district.

A tank with a capacity of 500,000 gallons was recently completed on the estate of the Rio Cauto Sugar Co., this (Oriente) Province. It is stated that oil will be secured from the Sinclair-Cuba Oil Co.

NETHERLAND'S NAVAL POLICY.

Source: Reliable.

(12532)

11 December, 1919.

The revised naval estimates as given out by the minister of marine have created very much opposition in naval circles and much comment in the press. A meeting was held a few days ago by the Association "Our Fleet" when a strong protest was issued against the reductions, especially with reference to the cancelling of the orders for the building of three cruisers. The Handelsblad publishes an article from the head of the naval staff at Nieuwediep. In it many arguments are brought forward against the minister's plan to stop the building operations in connection with the two criusers *Java* and the *Sumatra.* The paper says that it has also received numbers of letters

from naval officers, all of which are to the same effect and from which it is seen how unanimous is the indigation among the officers of the Navy with regard to the minister's plans. The paper is of opinion that the task of Holland's navy is in the first place the defense of the country and its colonies. The question to be put in the first place is: What material will be able to take part efficiently in that defense with a reasonable chance of timely success? The paper agrees with a number of naval officers and experts that for such a defensive war the first arm that is to be considered is the submarine, aeroplanes, and the laying of mines. The Handelsblad has also appealed to experts who stated that small cruisers are of no significance in a defensive war and can only be of assistance when attached to a deep-water fleet.

In the address sent to the minister by the naval officers the paper says that there is no convincing argument to be found to show that cruisers of the size of the *Java* and the *Sumatra* might play any rôle of significance in any system of defense for the colonies, and that the address is indiscreet when it states that if the building of these is not to be continued the whole fleet might just as well be demobilized.

GERMAN IMMIGRATION TO ARGENTINA.

Source: Reliable.

(12292)

6 November, 1919.

It is reported from a reliable source that so far 6,000 Germans have arrived in Argentina, 750 of whom have gone to Paraguay and 500 to Chile. Most of these immigrants are young men and ex-soldiers. Each group is in charge of a German officer, who, on arrival here, turns it over to heads of the German immigration society—Bussche (R215), Maynthusen (R205), Dr. Forkel (R252), Waedke (R225–250), etc. The immigrants are then sent to different parts of Argentina, Paraguay, and Chile, where they put them to work on the land purchased for that purpose. Others take what positions they can get.

Thirty per cent of those that have arrived are professional men, 20 per cent are agriculturists, and the remainder are military men, avowed monarchists, and hostile to the present German Government.

In the German legation a record is kept of the arrival of every officer and soldier.

The German immigration will continue for some time, as 30,000 passages have been engaged on the ships of the Holland Lloyd Steamship Co. Passengers will come out in small groups on account of the scarcity of tonnage.

U. S. MERCHANT MARINE AND DISCIPLINE.

Source: Reliable.

(10813)

12 November, 1919.

The late Admiral Mahan stated that our policy of building a strong navy before developing a large mercantile marine was like trying to balance a pyramid upon its apex. Merchant ships are a national training school for seamen, and it is from this class that a navy draws its reserve in time of war.

Our new mercantile marine has made its appearance in the port of Buenos Aires and there are many complaints of the lack of discipline and order among the crews. Most of the men are comparatively new to sea life, and have become impregnated with labor unionism, although they are better paid than the crews of other nations.

A case in point is the *City of Orleans*. The captain discharged two insubordinate members of his crew with the consent of the consul general, whereupon the local maritime federation, composed of longshoremen and river men took up the case, and was successful in its demands that the men be reinstated. If this practice of forcing masters of deep-sea ships to submit to the dictation of labor unions in foreign ports is continued and the authority of the master over his crew thus undermined, the result will be disastrous to discipline. The maritime federation in Buenos Aires is composed largely of Italians and Catalans of the lowest order of intelligence, and the leaders are paid agitators who are constantly making outrageous demands and ordering strikes to compel obedience to their mandates. The river and local coastwise trade has been completely demoralized by the absurd demands of these men, and they are turning their attention to foreign deep-water ships.

The old-fashioned word "mutiny" is now being shaded down to various forms of "collective bargaining."

GREAT BRITAIN'S ATLANTIC FLEET.

Source: Reliable.

Ships and Men.

The new Atlantic Fleet, compared with the Grand Fleet at the time of the armistice, is to be reduced from—

Battle squadrons, four to two.
Battle cruiser squadrons, two to one.
Cruiser squadrons, two to none.
Flying squadron, one to one ship.

Light cruiser squadrons, seven to two.
Destroyer flotillas, six to four.
Submarine flotillas, six to three (much smaller size).
Fleet sweeping flotillas, three to none.
Mine layers, one squadron and one flotilla to one ship.

Most of the ships withdrawn from home commands have been placed in the reserve or in the list of ships for disposal. Battleships, light cruisers, and torpedo craft employed in the Mediterranean have all returned, and the process of replacing them by more modern vessels is nearly complete.

BRITISH STANDARD SHIP LAUNCHED AT SHANGHAI.

Source: Reliable.

(2066A)

24 October, 1919.

The *War Diadem*, the first of three standard ships built to the order of the British Government, was launched at Shanghai on 11 October, 1919. The dimensions of the steamer are 331 feet 6 inches between perpendiculars by 46 feet 6 inches molded breadth and 25 feet 6 inches molded depth to upper deck. Owing to the fact that the war has been concluded since the construction of the vessel was started, alterations have been made in the masts by substituting steel lower masts and telescope top masts to suit the Manchester Canal requirements instead of the war type of folding masts so necessary for evading the submarine observers.

LATVIA—MILITARY.

Source: Reliable.

31 December, 1919.

The following translations of papers found on prisoners captured by the Letts during the attack of Bermont on Riga are interesting in that they show the inducements given the German troops to remain in the Baltic Provinces, and also the methods used by the German in getting recruits across the German frontier.

The following is a translation of the certificate given the soldiers of the Iron Division for use in claiming land in Latvia. As has been explained in previous reports, land in Latvia was promised those foreign soldiers who fought against the Bolsheviks, at the time of the Bolshevik invasion of Latvia.

Iron Division.

1 June, 1919.

CERTIFICATE No. ———

The Volunteer Paul Jutjahr_____
Name. Rank.

Riechoff Free Corps, born the 31st July, 1899, in Posondorff in the district of Weissenfels, has, through his having been attached for three months to the Iron Division and having taken part in the ejection of Bolshevism from the Baltic Provinces, and through his good conduct, become entitled to a piece of land, in case it should come to be divided up.

BISCHOFF,
Major and Commander.

FABER,
Colonization officer.

The following three papers are translations of the pass used not only by German soldiers on furlough, but, it is claimed also by German soldiers recruited in Germany and going to the Baltic Provinces to join the Iron Division or other troops under Von der Goltz.

It is interesting to note that these papers are dated as late as November, 1919.

Use of Express Trains.

EXTRA FURLOUGH FORM.

The Grenadier Gregor Sambeth.
(Rank, Christian and surnames)

of the 11 Battn. 2 Guards Res. Rgt., Plehwe Group.
(Company, regt., etc.)

is hereby granted furlough from 26 Oct. to and including 6 November, 1919, 3 o'clock at night to Wurzburg, Kitzingen.

All officials are requested to allow him to travel unhindered and to give him help and protection in case of necessity.

BATTN. HEADQUARTERS, 27 OCTOBER, 1919.

(Signed) _____,
1st Lieut. & Battn. Commander.

[Service stamp:
Royal Prussian
2 Guards Regt.,
11 Battn.]

_____,
(Signature, rank, and official function in own handwriting.)

1. The furlough form is to be shown openly and without waiting to be asked when buying the military ticket, and it is to be shown on demand during the journey and given up on returning after furlough.

2. Do not let yourself be questioned. Do not speak about military matters. (Danger of spies.)

3. When traveling on business always buy ordinary tickets.

[Stamp.]

CERTIFICATE.

For obtaining a military ticket.

Grenadier Gregor Sambeth _____ is
(Name and rank.)
entitled to buy a military ticket for a single journey from Wurzburg to Perkuln.

Object of the journey _____. Return to the troops _____ 2 Guards Res. Regiment 11 Battn. Plehwe Group _____.

REPORT No. 363.

31 October, 1919.

This certificate is only valid the 1st November and the four succeeding days.

Battn. Headquarters (Garrison town) the 28th 10_____ 1919.
(Exact description of the group of troops.)

(Signature) _____,
Rank and Commander (Leader).
Lieut. & _____

Permission to travel by an express train will be granted if an express-train extra ticket is taken.

When the use of express train is allowed, the certificate should be marked in red ink: "Use of express train allowed on purchase of an extra express-train ticket."

BATTALION HEADQUARTERS,
1 November, 1919.

CERTIFICATE.

The Grenadier Gregor Sambeth as member of the 2nd Reserve Regiment (Plehwe Group) according to order O. K. Northern Division La No. 5196 as v. 8th September, 1919, Zff. 4 has the right to cross the frontier near Bajohren or Laugszarjen.

A. B.
(Signed) _____,
Lieutenant & Adjutant.

[Stamp:
Royal Prussian 2nd Guards
Res. Regt.
11 Battalion.]

GERMAN TONNAGE.

16 October, 1919.

(12502)

Tonnage of German vessels due for delivery under terms of the peace treaty:

	Tons.
Steam vessels under 2,500 gross tons and over	853,966
Steam vessels of 1,600 to 2,499 gross tons	147,335
Sailing vessels of 1,600 gross tonnage and over	185,765
Vessels under construction, names not known	238,900

WIRELESS STATION AT BUENOS AIRES.

Source: Reliable.

(2213A)

6 November, 1919.

It is reported that a wireless station will be erected in the North Basin (Port of Buenos Aires). The construction will be in charge of an engineer of the Siemens Schuckert & Co., from whom the material has been ordered.

JAPAN.

The *Nagato*, the most powerful battleship in the world in point of gun size, was successfully launched last week at the Naval Port of Kure. The *Nagato* will have eight 16-inch guns and a speed of 23 knots. No ship in the American Navy has guns of this caliber at the present time.

AVIATION.

AVIATION EXPOSITION, PARIS.

Source: Reliable.

6 January, 1920.

1. The Salon d'Aeronautique was opened 19 December, 1919, the following aviation manufacturers exhibited:

Airco.	Hispano Suiza.
Astra.	Hutchinson.
Ansaldo Genes (steel machinery).	Isalta-Fraschini.
Adolphe Besson.	Late' Coére.
Alphonse Binet.	Liore & Olivier.
Blériot.	Lorraine-Dietrich.
Bombled.	Morane Saulnier.
Boultin & Paul.	Nieuport.
Louis Bréguet.	Panhard Levasseur.
Caproni.	Perelli.
Cauldron.	Renaud.
Louis Clément.	Salmon & Co.
Clement Bayard.	Salmson.
Clerget Blin.	Savoia.
Edmond de Marcay.	Sergeant.
Duraluminum.	Sunbeam.
Farman.	Bristol.
Fiat.	Vickers.
Gnome-Rhone.	Voisin.
Handley Page.	Westland.
Helice Integrale.	Zodiac.

2. The Blériot *Mammoth* was probably the most discussed of all the planes on exhibit. Its principal characteristics are:

Span	27 meters.
Length	15 meters 450.
Height	8 meters 400.
Surface (upper wing)	72 meters (square).
(lower wing)	72 meters (square).
Motor 4 Hispano	300 meters, 1,200 horsepower.
Propeller diameter	3 meters.
Gasoline (4 tanks)	1,600 liters.
Oil (4 tanks)	120 liters.
Weight (empty)	3,800 kilograms.
Useful load	2,250 kilograms.
Combustible	1,500 kilograms.
Total weight	7,550 kilograms.
Speed	150 kilometers.
Duration flight	6 hours, 20 minutes.
Passengers	26

3. These four motors, it is claimed, permit the plane to be flown when lightly loaded, with only two motors "in diagonal." However, four pilots have already been killed in test flights with this plane. Both accidents were due to the lower two motors losing power, and thereby causing the upper motors to throw the plane into a nose dive from which the pilot was unable to recover. (A British pilot has offered to make new trial flights with this plane for a cash sum of 9 000 pounds sterling.) It is considered most unsafe for air pilots. It cost nearly 250,000 francs to manufacture.

4. The now most likely appearing passenger-carrying planes are the British Handley Page and the Westland. The latter has the general outline features of the De Haviland. The characteristics of the Westland limousine are:

Span	38 feet 2 inches
Overall	28 feet 6 inches
Height	10 feet 9 inches
Normal speed	85 miles per hour
Maximum	112 miles per hour
Landing speed	50 miles per hour
Radius of action	3 hours
Weight (loaded)	3,560 pounds
Surface	435 square feet
Loading	8.2 pounds per square foot
Gap	6 feet
Chord	6 feet 3 inches
Stagger	12 inches
Incidence	2 degrees
Dehedral	2½ degrees
Motor (Falcon III Rolls Royce) (Low compression pistons.)	275 horsepower

The Handley Page is the regular bimotor type fitted with two 450 Napier-Lion motors.

4. The Farman "Goliath" (bimotor) and the "Cauldron" C–25 (trimotor) are two other practical types of passenger carriers. The characteristics of the Cauldron are:

Span	25 meters
Length	19 meters
Surface	155 square meters
Height	5 meters 45 centimeters
3 moteurs (radial)	250 horsepower
Speed	165 kilometers per hour
Passengers	18
Pilots	2
Radius	6 hours
Weight (empty)	3,400 kilograms
Useful load and combustible	2,100 kilograms
Total weight	5,500 kilograms

The smallest machine is the De Marçay biplane *Passe-Partout* whose characteristics are:

Span	4 meters.
Length	3 meters 50 centimeters.
Surface	8 square meters 9.50
Motor	2-cylinder A. B. C. 10 horsepower.
Speed	110 kilometers per hour.
Weight with pilot and 2 hours gas	189 kilograms (395 pounds).
Weight empty	100 kilograms (220 pounds).
Speed	110 kilometers per hour.

The Bristol *Baby* with span of 18 feet and length of 12 feet was the next smallest on exhibit.

6. The Henry Potez biplane, double control, biplane designed for economic civil use has a very original motor installation. The motor is the Henry Potez automobile type, four cylinders in line, air cooled, weight 220 pounds. The motor is entirely exposed to the air, the crank shaft being vertical, and cylinders horizontal, the propeller shaft being just above the motor. A right-angle level gear drives the propeller and also gears down the number of revolutions.

The chassis has four wheels, two under leading edge and two under trailing edge of lower wing. Characteristics are:

Span	8 meters.
Length	6 meters 63
Height	2 meters 450
Weight (empty)	220 kilograms.
Useful load and gasoline	200 kilograms.
Total weight	420 kilograms.
Loading per square meter	22 kilograms.

7. The Caproni triplane, three-motor Fiat 200, is also on exhibition.

8. The two most interesting military planes, both post-war products, are the Nieuport and the Spad S. A. B. (Bechereau). The latter mounts four machine guns, two of which fire through the propeller, being mounted just over the engine in the usual fashion, and the remaining two being fixed on the upper wing, one right and one left, so as to fire just outside of the propeller circle. The motor is the 320 Hispano-Suiza, speed 205 km. per hour.

9. The Morane-Saulnier C° exhibit their well-known Le Rhone-motored acrobatic monoplane (safety factor 17) as well as the Morane-Liberty, fitted with Lamblin cage radiators under fuselage, but this plane has not as yet lived up to expectations. They also have a touring 80-horsepower Le Rhone, which is very light and yet has safety factor of 10.

10. The Boulton & Paul, fitted with 100-horsepower Cosmos engine, all-metal construction, is interesting. It is claimed to be as light

as wood construction. As all joints are riveted and not oxyacetylene welded, it appears to be a very laborious production.

Liore & Oliver have a metal fuselage with the pilot's compartment armored with three-sixteenths-inch steel plate, which type is used for work with infantry and also for the colonial police. The tail and fuselage are duraluminium.

11. Several of the pioneer types of airplanes were also shown to illustrate the progress of aviation.

12. The Italian Fiat, with 700 horsepower Fiat motor, is very formidable looking. The manufacturers claim 260 kilometers per hour speed and 20 hours endurance. It has the following characteristics:

Span	16 meters 10 centimeters.
Length	10 meters 10 centimeters.
Height	3 meters 40 centimeters.
Surface	70 meters square.
Loading	61 kilos per square meters.
Loading	6 kilo 9 per horsepower.
Gas consumption	135 liters per hour.

Struts are metal and everything is well streamlined.

13. The Breguet convertible airplane-seaplane, now used by French in the East, has a single detachable float, and permits replacing by wheels without any structural changes. It has 300 horsepower Renault motor.

14. The Bristol Bullet is equipped with a 9 cylinder 450 horsepower Jupiter Cosmos radial motor.

15. The Savoia boat.—The type used in the Schneider cup races in England, is equipped with a single 300 horsepower Fiat engine, which is mounted in a fuselage above the boat.

16. The Liore & Oliver C° has a three motored seaplane limousine with wing construction resembling the Tellier. Struts are metal. The boat is short and wide with V bottom, almost flat. The pilot is above the passenger cockpit in a separate compartment. French technical section are not very enthusiastic over this machine.

17. The various motors on exhibit include:

Peugeot.—16-cylinder, X type, 4 cylinders in each row, developing 500 horsepower at 1,400 revolutions.

Peugeot.—12-cylinder, V type, of 600 horsepower.

Sunbeam Sink.—12-cylinder V type, 800 horsepower; 12-cylinder, V type, 420 horsepower.

Panhard.—16-cylinder, V type, 4 rows of 4 cylinders each, 600 to 800 horsepower.

Gnome-Rhone.—60 horsepower, 100 horsepower, 180 horsepower, and 50 horsepower.

Breguet-Bugatti.—Combination 4 motor power plant. Consists of 4 six-cylinder Bugatti engines driving one shaft and developing 800 horsepower.

Lorraine-Dietrich.—100 horsepower, 24-cylinder, arranged in a double V of 8 cylinders in each bank; 500 to 600 horsepower; motor V type, 12-cylinder.

Renault.—450 horsepower, 12-cylinder, V type, similar to well-known 280 horsepower motor.

Anzani.—600 horsepower, consisting of 2 rings of 10 cylinders each.

18. The lighter-than-air-craft exhibit consists of models of the various well-known types of dirigibles and type balloons. There is nothing whatsoever new in this line of exhibit.

AVIATION, MISCELLANEOUS NOTES.

Source: Reliable.

9 January, 1920.

The following information has been received from a reliable source in Buenos Aires, regarding aviation:

> "A German aviation mission will be formed here soon. At present there are 20 German aviation officers here and more are expected to come. The materials are to be shipped privately from Germany. They will build their hangars behind the Palomar military aviation field, which has already been designated for that purpose by the Argentine Government."

General.

The commanding officer of the naval air station, San Diego, Calif., in a letter of 2 January to Chief of Naval Operations, reports on observations flight with the aerial fish patrol from that station, for two hours on 26 December. Three small schools of sardines were located in the cove off of La Jolla. The location of the three schools of sardines was immediately radioed to the naval air station and the information was in the office of the fish and game commissioner in less than five minutes after they had been sighted. The fish and game commissioner then notified approximately 20 of the various fishing industries in San Diego of the results of the patrol.

The aerial fish patrol has been operating from that station since 15 December, over which period, it is felt, not only by the commanding officer, but by the fish and game commission and the fishing interests in San Diego, that these patrols have been responsible for bringing into that port in the neighborhood of 100 tons of sardines, which otherwise would not have been caught.

Mr. Hogan, after his flight with the aerial fish patrol, stated that while the seaplane in which he was flying did not make contact with schools of fish, he personally sighted four individual fish at a point some 7 miles at sea and that this fact convinced him that as a general proposition the aerial fish patrol will be of the greatest possible value to the fishing interest, in that schools of fish can be located without a question of a doubt from seaplanes, and their exact location can be transmitted by radio from the seaplanes to the shore base or to a subchaser or other vessels located on the fishing grounds. Mr. Hogan stated that he thought that without any question anybody, after one or two flights, could easily locate any schools of fish which might be in the areas being patrolled, and that after some practice the searchers would be able to distinguish the kind of fish in the schools.

AEROGRAPHY.

Source: Reliable.

23 December, 1919.

The new aerological field outfit, which was recently shipped here, was given a trial demonstration by the aerological staff of the station under the direction of an officer from the Naval Observatory.

Under the adverse weather conditions, which existed on the day of the trial, the outfit was unpacked, the tent erected, and the instruments installed in one and one-half hours. The dismantling of the outfit and repacking of all except the delicate instruments was accomplished the same day in one hour. Another hour was required to repack the instruments. Six men were used for this work.

This outfit comprises, in a portable form, all the meteorological instruments, supplies, and accessories necessary for forecasting from local weather conditions, for furnishing surface meteorological data relative to aviation, and for obtaining wind conditions aloft by pilot balloons soundings. The entire equipment, including a flask of hydrogen for inflating pilot balloons, weighs less than 1,000 pounds and is packed in five pieces. A conservative estimate drawn from the test is that using six men, at least two of them having had experience in aerology, all of the usual data desired on local meteorological conditions, including wind conditions up to 4,000 feet altitude, could be furnished within two hours after the outfit had been set ashore on a sandy beach, a landing pier, or other ordinary situation with an unobstructed space 50 feet square and a satisfactory exposure to the meteorological elements. When need for the field station had passed, the outfit could be dismantled and repacked ready for shipment in about two hours.

STEAM ENGINEERING.

Source: Reliable.

8 January, 1920.

The test charts on the final test of the 3-cylinder Lawrence engine shows that at full throttle the engine gives approximately 65 horsepower and 1,850 revolutions per minute. The gasoline consumption is 0.507 pound per horsepower per hour, and oil 0.044 pound per horsepower per hour.

On the acceptance test, the engine ran for 3 hours at approximately 0.9 full power delivering an average of 57 horsepower with a fuel consumption of 0.476 pound per horsepower per hour and oil consumption of 0.054 pound per hour.

The engine was found to idle very well at 300 revolutions per minute and has brake mean effective pressure of 124.2 pounds.

The engine weighs approximately 125 pounds, and it is believed to be the best engine of this type in existence. The engine affords excellent foundation for further development of air-cooled radials in the United States.

Experiments were caried on for distilling reclaimed gasoline, and a product has been obtained which compares very favorably with the commercial gasoline used in the motor-truck service.

TARGET PRACTICE AVIATION.

Source: Reliable.

27 December, 1919.

The following information of the target practice just completed is published in advance of the record of scores. Out of the 42 live bombs, Mark IV with Mark VI fuse, expended, 40 were actually tripped by observers and 39 detonated. One bomb was lost, not released, from an H–16 while banked on a turn at 1,500-foot elevation and did not detonate. One bomb was lost, not released from the same H–16 just after getting off the water at about 20-foot elevation and did not detonate. The fact that the record of detonation last year with old-type fuses was 46 per cent, and this year's record of detonation of bombs actually tripped is 97.5 per cent speaks well for the Mark VI fuse recently developed by the Bureau of Ordnance.

AVIATION, NOTES ON.—HYDROPLANE.

Source: Reliable.

8 January, 1920.

The Bureau of Steam Engineering has received pictures of Dr. Alexander Graham Bell's hydroplane, known as the *HD-4*. This boat is equipped with two power plants, each one identical with

that installed on the *HS-1* type of flying boat. The machine weighs approximately 11,000 pounds and has made a top speed of 71 miles an hour on a draft of approximately 6 inches. The boat at rest has a draft of about 4½ feet.

PROPOSED ADRIATIC AERIAL SERVICE.

Source: Reliable.

13 December, 1919.

A plan for service of aerial communications between the shores of the Adriatic has been presented to the director general of aeronautics by the Societa Industrie Aeronautiche e Meccaniche d'Italia of Perugia.

The following routes have been proposed:

Ancona—Pola—Fiume.
Fiume—Zara—Sebenico—Spalato—Lissa.
Lissa—Metcovic—Ragusa—Cattaro—Scutari—Durazzo.
Durazzo—Vallona—Corfu.
Corfu—Brindisi.

Vessels under construction, United States Navy. Degree of completion and probable dates of completion, as reported Dec. 31, 1919.

BATTLESHIPS.

Type, number, and name.	Contractor.	Per cent of completion.				Contract date of completion.	Probable date of completion.
		Jan. 1, 1920.		Dec. 1, 1919.			
		Total.	On ship.	Total.	On ship.		
43. Tennessee	New York Navy Yard	96.0	92.3	93.5	89.5		(1)
44. California	Mare Island Navy Yard	87.2	80.7	84.1	77.3		(1)
45. Colorado	New York Ship Building Corporation	40.2	23.3	37.1	20.6		Jan. —, 1922
46. Maryland	Newport News Ship Building & Dry Dock Co.	60.0	52.6	58.0	51.2		Jan. —, 1922
47. Washington	New York Ship Building Corporation	38.9	22.2	36.1	19.3		July —, 1922
48. West Virginia	Newport News Ship Building & Dry Dock Co.	27.0	4.2	27.0	3.2		(1)
49. South Dakota	New York Navy Yard	5.6	0.4				(1)
50. Indiana	do	5.6	0.4				(1)
51. Montana	Mare Island Navy Yard	3.0	0.0				(1)
52. North Carolina	Norfolk Navy Yard	3.8	0.3				(1)
53. Iowa	Newport News Ship Building & Dry Dock Co.						
54. Massachusetts	Bethlehem Ship Building Corporation (Fore River).						

BATTLE CRUISERS.

1. Lexington	Bethlehem Ship Building Corporation (Fore River).	Preliminary modified plans and specifications furnished builders. Development of working plans in progress. Structural steel being ordered.
2. Constellation	Newport News Ship Building & Dry Dock Co.	
3. Saratoga	New York Ship Building Corporation	
4. Ranger	Newport News Ship Building & Dry Dock Co.	
5. Constitution	Philadelphia Navy Yard	
6. United States	do	

SCOUT CRUISERS.

4	Todd Dry Dock & Construction Corporation	34.0	11.5	32.2	10.8	Aug. 1, 1921	Dec. —, 1921
5	do	32.1	9.3	30.1	9.1	Dec. 1, 1921	Apr. —, 1922
6	do	24.0	2.0	24.0	2.0	July 1, 1922	Aug. —, 1922
7	Bethlehem Shipbuilding Corporation (Fore River).	3.5	1.8	2.8	1.7	Aug. 1, 1921	(1)
8	do	3.5	1.8	2.8	1.7	Nov. 1, 1921	(1)
9	Wm. Cramp & Sons Co	23.0	.....	20.0	.....	.....	Aug. 1, 1921
10	do	22.0	.....	20.0	.....	.....	Sept. 15, 1921
11	do	8.0	.....	7.0	.....	Oct. 1, 1921	Nov. 15, 1921
12	do	8.0	.....	7.0	.....	Jan. 1, 1922	Dec. 15, 1921
13	do	8.0	.....	7.0	.....	Apr. 1, 1922	Feb. 15, 1922

MISCELLANEOUS.

Fuel ship No. 17, Neches	Boston Navy Yard	48.3	41.7	42.7	35.1	.....	Sept. —, 1920
Fuel ship No. 18, Pecos	do	19.2	3.1	17.9	0.8	.....	June —, 1921
Gunboat No. 21, Asheville	Charleston Navy Yard	94.5	92.5	93.0	90.0	.....	(1)
Gunboat No. 22	do	11.8	9.8	8.9	6.9	.....	(1)
Hospital ship No. 1, Relief	Philadelphia Navy Yard	66.5	62.5	61.5	57.5	.....	Sept. 1, 1920
Ammunition ship No. 1, Pyro	Puget Sound Navy Yard	99.0	97.5	98.5	97.0	.....	May 1, 1920
Ammunition ship No. 2, Nitro	do	85.0	74.0	76.0	62.0	.....	July 1, 1920
Repair ship No. 1, Medusa	do	16.0	0.0	14.0	0.0	.....	Feb. 25, 1921
Destroyer tender No. 3, Dobbin	Philadelphia Navy Yard	10.0	5.2	7.0	3.2	.....	July 1, 1921
Destroyer tender No. 4, Whitney	Boston Navy Yard	0.0	0.0	.....	.....	.....	(1)
Submarine tender No. 3, Holland	Puget Sound Navy Yard	0.0	0.0	.....	.....	.....	(1)

[1] Indeterminate.

Vessels under construction United States Navy. Degree of completion and probable date of completion, as reported Dec. 31, 1919—Continued.

MISCELLANEOUS VESSELS AUTHORIZED BUT NOT UNDER CONSTRUCTION OR CONTRACT.

(1) Transport No. 2

OIL TANKERS.

Type, number, and name.	Contractor.	Per cent of completion.				Contract date of completion.	Probable date of completion.
		Jan. 1, 1920.		Dec. 1, 1919.			
		Total.	On ship.	Total.	On ship.		
1652. Laramie	Wm. Cramp & Sons Co	88.0	.....	83.0	.....	Oct. 1, 1919	Jan. 25, 1920
1653. Mattole	do	75.0	.....	72.0	.....	Nov. 1, 1919	Apr. 15, 1920
1657. Salinas	Newport News Shipbuilding & Dry Dock Co	80.0	.....	70.0	.....	do	Feb. —, 1920
1658. Sapelo	do	90.0	.....	80.0	.....	Dec. 1, 1919	Jan. —, 1920
1659. Sepulga	do	40.0	.....	30.0	.....	Jan. 1, 1920	June —, 1920
1660. Tippecanoe	do	30.0	.....	20.0	.....	Feb. 1, 1920	Aug. —, 1920
1661. Trinity	do	20.0	.....	5.0	.....	Mar. 1, 1920	Sept. —, 1920
FUEL OIL BARGES.							
20	Tank Shipbuilding Corporation	96.0	.....	90.0	.....	Aug. 11, 1919	Jan. 15, 1920
21	do	90.0	.....	80.0	.....	Sept. 5, 1919	Feb. 25, 1920
22	do	80.0	.....	68.0	.....	Sept. 30, 1919	Mar. 20, 1920
23	do	78.0	.....	66.0	.....	Oct. 25, 1919	Apr. 15, 1920
24	do	70.0	.....	61.0	.....	Nov. 19, 1919	Apr. 30, 1920
30	Todd Shipyards Corporation	(1)	.....	99.0	.....	Aug. 2, 1919	.....
31	do	95.0	.....	90.0	.....	Aug. 26, 1919	Jan. 24, 1920
32	do	89.0	.....	85.0	.....	Sept. 20, 1919	Mar. 10. 1920

71. Gwin	Seattle Construction & Dry Dock Co	97.4	97.4	97.4	97.4	Nov. 8, 1917	Feb. —, 1920
135. Tillman	Charleston Navy Yard	81.0	77.0	79.4	75.4		Sept. 30, 1920
141. Hamilton	Mare Island Navy Yard	(2)		99.9	99.9		
158. Leary	New York Shipbuilding Corporation	(3)		99.0			
179. Howard	Union Iron Works	98.3	98.3	98.3	98.3		Jan. 28, 1920
180. Stansbury	do	99.3	99.3	99.3	99.3		Jan. 6, 1920
187. Dahlgren	Newport News Ship Building & Dry Dock Co	99.0		95.0			Jan. —, 1920
188. Goldsborough	do	97.0		95.0			Jan. —, 1920
189. Semmes	do	97.0		95.0			Feb. —, 1920
190. Satterlee	do	(4)		97.0			
191. Mason	do	83.0		82.0			(5)
192. Graham	do	79.0		78.0			(5)
193. Abel P. Upshur	do	66.0		65.0			(5)
194. Hunt	do	66.0		65.0			(5)
195. Welborn C. Wood	do	64.0		63.0			(5)
196. George E. Badger	do	64.0		63.0			(5)
197. Branch	do	73.0		72.0			(5)
198. Herndon	do	68.0		67.0			(5)
199. Dallas	do	68.0		67.0			(5)
212. Smith Thompson	Wm. Cramp & Sons Co	(6)		97.0			
213. Barker	do	(7)		93.0			
214. Tracy	do	97.0		89.0			Jan. 10, 1920
215. Borie	do	91.0		85.0			Jan. 30, 1920
216. John D. Edwards	do	85.0		80.0			Feb. 20, 1920
217. Whipple	do	80.0		74.0			Mar. 10, 1920
218. Parrott	do	75.0		68.0			Mar. 30, 1920
219. Edsall	do	60.0		58.0			Apr. 20, 1920
220. MacLeish	do	67.0		59.0			May 10, 1920
221.	do	57.0		52.0			May 30, 1920
222. Bulmer	do	63.0		53.0			June 20, 1920
223.	do	60.0		53.0			July 10, 1920

[1] Delivered Dec. 5, 1919.
[2] Delivered Dec. 27, 1919.
[3] Delivered Dec. 5, 1919.
[4] Delivered Dec. 22, 1919.
[5] Indeterminate.
[6] Delivered Dec. 10, 1919.
[7] Delivered Dec. 27, 1919.

Vessels under construction, United States Navy. Degree of completion and probable dates of completion, as reported Dec. 31, 1919—Continued.

DESTROYERS—Continued.

Type, number, and name.	Contractor.	Per cent of completion.				Contract date of completion.	Probable date of completion.
		Jan. 1, 1920.		Dec. 1, 1919.			
		Total.	On ship.	Total.	On ship.		
224. Stewart	Wm. Cramp & Sons Co	62.0	.....	50.0	.....	.....	July 30, 1920
225.	....do	55.0	.....	50.0	.....	.....	Aug. 20, 1920
226.	....do	54.0	.....	50.0	.....	.....	Sept. 10, 1920
227.	....do	46.0	.....	43.0	.....	.....	Sept. 30, 1920
228.	....do	44.0	.....	40.0	.....	.....	Oct. 20, 1920
229.	....do	38.0	.....	35.0	.....	.....	Nov. 10, 1920
230.	....do	37.0	.....	35.0	.....	.....	Nov. 30, 1920
231. Hatfield	New York Ship Building Corporation	97.0	.....	96.0	.....	.....	Jan. 31, 1920
232. Brooks	....do	90.0	.....	89.8	.....	.....	Mar. 10, 1920
233. Gilmer	....do	95.0	.....	90.9	.....	.....	Feb. 16, 1920
234. Fox	....do	92.0	.....	86.8	.....	.....	Feb. 27, 1920
235. Kane	....do	86.0	.....	82.7	.....	.....	Mar. —, 1920
236. Humphreys	....do	83.5	.....	82.0	.....	.....	Apr. —, 1920
237. McFarland	....do	73.6	.....	71.6	.....	.....	July —, 1920
238. James K. Paulding	....do	69.0	.....	67.8	.....	.....	Aug. —, 1920
239. Overton	....do	84.5	.....	82.0	.....	.....	Apr. —, 1920
240. Sturtevant	....do	74.3	.....	72.3	.....	.....	June —, 1920
241. Childs	....do	65.3	.....	59.5	.....	.....	June —, 1920
242. King	....do	62.5	.....	57.1	.....	.....	July —, 1920
243. Sands	....do	77.2	.....	74.2	.....	.....	May —, 1920
244. Williamson	....do	79.3	.....	76.3	.....	.....	May —, 1920
245. Reuben James	....do	79.7	.....	76.6	.....	.....	Apr. —, 1920
246.	....do	54.3	.....	51.3	.....	.....	Aug. —, 1920
247.	....do	50.6	.....	47.4	.....	.....	Aug. —, 1920
248.	....do	50.8	.....	48.3	.....	.....	Sept. —, 1920
249.	....do	43.2	.....	40.7	.....	.....	Sept. —, 1920
250.	....do	44.4	.....	41.9	.....	.....	Sept. —, 1920

286. Lardner	Bethlehem Ship Building Corporation (Squantum).	(1)	.....	96.5	96.0	.....	
287. Putnam	....do	(2)	.....	94.0	93.0	.....	
288. Worden	....do	(3)	.....	91.5	90.0	.....	
289. Flusser	....do	(4)	.....	88.0	86.0	.....	
290. Dale	....do	97.0	97.0	84.5	82.2	.....	Jan. 10, 1920
291. Converse	....do	93.5	92.5	80.5	77.5	.....	Jan. 20, 1920
293. Billingsley	....do	88.0	86.0	75.5	71.2	.....	Jan. 25, 1920
294. Ausburn	....do	84.5	82.0	73.5	68.5	.....	Feb. 15, 1920
295. Osborne	....do	82.0	79.0	72.0	66.7	.....	Feb. 25, 1920
297. Fuller	Bethlehem Ship Building Corporation (San Francisco).	95.6	93.0	95.6	93.0	.....	Jan. 30, 1920
298. Percival	....do	91.4	87.2	91.4	87.2	.....	Feb. 17, 1920
299. John Francis Burnes	....do	[5] 87.3	82.5	87.3	82.5	.....	(6)
300. Farragut	....do	[5] 85.2	80.0	85.2	80.0	.....	(6)
301. Somers	....do	[5] 82.4	76.8	82.4	76.8	.....	(6)
302. Stoddert	....do	[5] 81.0	75.3	81.0	75.3	.....	(6)
303. Reno	....do	[5] 79.2	73.1	79.2	73.1	.....	(6)
304. Farquhar	....do	[5] 78.8	72.5	78.8	72.5	.....	(6)
305. Thompson	....do	[5] 72.6	65.0	72.6	65.0	.....	(6)
306. Kennedy	....do	[5] 72.1	64.5	72.1	64.5	.....	(6)
307. Paul Hamilton	....do	[5] 72.2	64.6	72.2	64.6	.....	(6)
308. William Jones	....do	[5] 72.3	64.6	72.3	64.6	.....	(6)
309. Woodbury	....do	[5] 72.1	64.5	72.1	64.5	.....	(6)
310. S. P. Lee	....do	[5] 73.6	66.2	73.6	66.2	.....	(6)
311. Nicholas	....do	[5] 73.6	66.2	73.6	66.2	.....	(6)
312. Young	....do	[5] 73.3	65.8	73.3	65.8	.....	(6)
313. Zeilin	....do	[5] 73.3	65.9	73.3	65.9	.....	(6)
314. Yarborough	....do	[5] 73.5	66.1	73.5	66.1	.....	(6)
315. LaVallette	....do	[5] 73.8	66.5	73.8	66.5	.....	(6)
316. Sloat	....do	[5] 73.5	65.8	73.5	65.8	.....	(6)
317. Wood	....do	[5] 72.0	64.1	72.0	64.1	.....	(6)
318. Shirk	....do	[5] 73.8	66.5	73.8	66.5	.....	(6)
319. Kidder	....do	[5] 73.8	66.5	73.8	66.5	.....	(6)
320. Selfridge	....do	[5] 73.7	66.0	73.7	66.0	.....	(6)
321. Marcus	....do	[5] 73.1	65.3	73.1	65.3	.....	(6)
322. Mervine	....do	[5] 73.0	65.3	73.0	65.3	.....	(6)

[1] Delivered Dec. 10, 1910.
[2] Delivered Dec. 18, 1919.
[3] Delivered Dec. 23, 1919.
[4] Delivered Dec. 31, 1919.
[5] No progress on account of strike.
[6] Indeterminate.

Vessels under construction, United States Navy. Degree of completion and probable dates of completion, as reported Dec. 31, 1919—Continued.

DESTROYERS—Continued.

Type, number, and name.	Contractor.	Per cent of completion.				Contract date of completion.	Probable date of completion.
		Jan. 1, 1920.		Dec. 1, 1919.			
		Total.	On ship.	Total.	On ship.		
323. Chase	Bethlehem Ship Building Corporation (San Francisco).	[1] 72.9	65.2	72.9	65.2		[2]
324. Robert Smith	do	[1] 73.0	65.2	73.0	65.2		[2]
325. Mullany	do	[1] 69.1	61.3	69.1	61.3		[2]
326. Coghlan	do	[1] 66.6	58.7	66.6	58.7		[2]
327. Preston	do	[1] 60.4	52.3	60.4	52.3		[2]
328. Lamson	do	[1] 56.1	47.6	56.1	47.6		[2]
329. Bruce	do	[1] 57.5	49.1	57.5	49.1		[2]
330	do	[1] 34.3	22.9	34.3	22.9		[2]
331	do	[1] 34.3	22.9	34.3	22.9		[2]
332	do	[1] 34.3	22.9	34.3	22.9		[2]
333	do	[1] 45.9	36.7	45.9	36.7		[2]
334	do	[1] 34.3	22.9	34.3	22.9		[2]
335	do	[1] 34.3	22.9	34.3	22.9		[2]
336. Litchfield	Mare Island Navy Yard	81.2	80.7	76.2	75.5		Apr. 1, 1920
337. Zane	do	76.3	75.8	70.4	69.7		June 1, 1920
338. Wasmuth	do	60.5	58.7	55.6	53.7		Aug. 1, 1920
339. Trever	do	57.2	55.4	53.1	51.2		Oct. 1, 1920
340	do	37.1	33.7	36.1	32.6		Dec. 1, 1920
341	do	34.3	30.9	33.6	30.1		Jan. 1, 1921
342. Hulbert	Norfolk Navy Yard	86.0	83.5	82.2	79.2		Apr. 1, 1920
343. Noa	do	86.0	83.5	82.2	79.2		May 1, 1920
344. William B. Preston	do	89.5	87.5	82.2	79.2		Feb. 1, 1920
345. Preble	Bath Iron Works	88.1	87.5	80.4	78.4		Jan. 31, 1920
346. Sicard	do	71.7	67.1	65.2	59.0		Mar. 6, 1920
347. Pruitt	do	57.9	51.9	52.9	44.3		May 15, 1920

[1] No progress on account of strike

[2] Indeterminate.

DESTROYERS AUTHORIZED BUT NOT UNDER CONSTRUCTION OR CONTRACT.

(12) Nos. 348 to 359, inclusive.

SUBMARINES.

52. AA–1	Electric Boat Co. (Quincy)	97.6	97.6	97.6	97.6	Mar. 19, 1918	Jan. 15, 1920
60. AA–2	do	96.1	96.1	96.1	96.1	Oct. 2, 1918	Apr. 1, 1920
61. AA–3	do	96.3	96.3	96.3	96.3	Dec. 2, 1918	Mar. 1, 1920
91. R–14	do	(1)	(1)	98.5	98.5	Sept. 23, 1919	.....
105. S–1	do	97.5	97.5	97.5	97.5	May 8, 1919	(2)
106. S–2	Lake Torpedo Boat Co. (Bridgeport)	99.0	99.0	99.0	99.0	.....	Apr. 1, 1920
110. S–5	Portsmouth, N. H., Navy Yard	93.8	92.2	92.6	91.1	.....	Feb. —, 1920
111. S–6	do	89.0	87.5	88.9	84.8	.....	Mar. —, 1920
112. S–7	do	79.7	75.8	80.5	73.3	.....	May —, 1920
113. S–8	do	64.1	59.3	60.5	54.2	.....	May —, 1920
114. S–9	do	55.8	49.1	55.6	48.5	.....	June —, 1920
115. S–10	do	37.5	31.2	37.2	29.7	.....	Aug. —, 1920
116. S–11	do	28.0	21.0	26.6	18.8	.....	Aug. —, 1920
117. S–12	do	26.7	19.1	26.3	18.7	.....	Sept. —, 1920
118. S–13	do	25.5	18.7	25.0	18.2	.....	Sept. —, 1920
119. S–14	Lake Torpedo Boat Co. (Bridgeport)	74.7	71.3	72.2	67.5	July 12, 1919	May 1, 1920
120. S–15	do	58.6	46.6	58.0	43.8	Aug. 12, 1919	June 1, 1920
121. S–16	do	69.6	65.5	60.8	54.5	Sept. 12, 1919	July 1, 1920
122. S–17	do	58.1	45.0	56.9	42.2	Oct. 12, 1919	Aug. 1, 1920
123. S–18	Electric Boat Co. (Quincy)	92.6	92.1	91.5	88.8	Feb. 17, 1919	(2)
124. S–19	do	91.5	90.0	90.5	87.6	Mar. 17, 1919	(2)
125. S–20	do	91.0	88.5	90.0	87.0	do	(2)
126. S–21	do	90.0	87.0	89.0	85.5	Apr. 17, 1919	(2)
127. S–22	do	89.0	85.5	88.0	84.0	do	(2)
128. S–23	do	88.5	84.7	87.5	83.5	May 17, 1919	(2)
129. S–24	do	87.5	83.0	86.5	81.5	do	(2)
130. S–25	do	87.0	82.0	86.0	80.5	June 17, 1919	(2)
131. S–26	do	86.5	81.2	86.0	80.5	do	(2)
132. S–27	do	83.5	77.5	82.0	75.5	do	(2)
133. S–28	do	83.0	77.0	82.0	75.5	July 17, 1919	(2)
134. S–29	do	83.0	77.0	82.0	75.5	do	(2)

[1] Delivered Dec. 24, 1919.

[2] Indeterminate.

Vessels under construction, United States Navy. Degree of completion and probable dates of completion, as reported Dec. 31, 1919—Continued.

SUBMARINES—Continued.

Type, number and name.	Contractor.	Per cent of completion.				Contract date of completion.	Probable date of completion.
		Jan. 1, 1920.		Dec. 1, 1919.			
		Total.	On ship.	Total.	On ship.		
135. S–30	Electric Boat Co. (San Francisco)	[1] 92.1	91.4	92.1	91.4	Nov. 17, 1918	[2]
136. S–31	do	[1] 87.6	85.9	87.6	85.9	Dec. 17, 1918	[2]
137. S–32	do	[1] 87.2	85.7	87.2	85.7	do	[2]
138. S–33	do	[1] 88.7	87.5	88.7	87.5	Jan. 17, 1919	[2]
139. S–34	do	[1] 76.2	73.3	76.2	73.3	do	[2]
140. S–35	do	[1] 73.7	67.0	73.7	67.0	do	[2]
141. S–36	do	[1] 73.3	66.6	73.3	66.6	Feb. 17, 1919	[2]
142. S–37	do	[1] 70.8	63.5	70.8	63.5	do	[2]
143. S–38	do	[1] 71.1	63.9	71.1	63.9	do	[2]
144. S–39	do	[1] 67.2	59.7	67.2	59.7	Mar. 17, 1919	[2]
145. S–40	do	[1] 57.0	48.9	57.0	48.9	do	[2]
146. S–41	do	[1] 55.7	45.9	55.7	45.9	do	[2]
153. S–42	Electric Boat Co. (Quincy)	2.8	.7	2.3	.5	Dec. 30, 1920	[2]
154 S–43	do	2.8	0.7	2.3	0.5	Jan. 30, 1921	[2]
155 S–44	do	2.8	.7	2.3	.5	Feb. 28, 1921	[2]
156 S–45	do	2.8	.7	2.3	.5	Mar. 30, 1921	[2]
157 S–46	do	2.8	.7	2.3	.5	Apr. 30, 1921	[2]
158 S–47	do	2.8	.7	2.3	.5	May 30, 1921	[2]
159 S–48	Lake Torpedo Boat Co. (Bridgeport)	0.0	0.0	0.0	0.0	July 1, 1921	[2]
160 S–49	do	0.0	0.0	0.0	0.0	Aug. 1, 1921	[2]
161 S–50	do	0.0	0.0	0.0	0.0	Sept. 1, 1921	[2]
162 S–51	do	0.0	0.0	0.0	0.0	Oct. 1, 1921	[2]

[1] No progress on account of strike.

[2] Indeterminate.

NOTE (A) Submarines authorized but not under construction or contract:
Fleet Submarines (9) Nos. 163 to 171.
Neff Submarine (1) No. 108

MINE SWEEPERS.

46. Peacock	Staten Island Shipbuilding Co	(1)	(1)	99. 2	.....	Dec. 30, 1918	.....
53. Warbler	Philadelphia Navy Yard	(2)	(2)	92. 0	91. 0	.....	.....
54. Willet	do	93. 0	92. 0	84. 0	83. 0	.....	Jan. 20, 1920

SEAGOING TUGS.

25. Umpqua	Ferguson Ship & Iron Corporation	(3)	(3)	99. 0	.....	June 30, 1919	.....
26. Wandank	do	96. 0	.....	92. 0	.....	do	Jan. 30, 1920
31. Koka	Puget Sound Navy Yard	95. 0	93. 0	88. 0	87. 0	.....	Jan. 31, 1920
33. Pinola	do	97. 0	95. 0	92. 0	90. 0	.....	Jan. 24, 1920
34. Algorma	Staten Island Shipbuilding Co., Port Richmond.	93. 0	.....	93. 0	.....	Apr. 12, 1919	Mar. 5, 1920
35. Carrabassett	do	87. 0	.....	86. 0	.....	Apr. 19, 1919	Apr. 7, 1920
36. Contocook	do	70. 0	.....	68. 0	.....	Apr. 26, 1919	Apr. 15, 1920
37. Iuka	do	68. 0	.....	66. 0	.....	May 3, 1919	May 15, 1920
38. Keosanqua	do	60. 0	.....	58. 0	.....	May 10, 1919	May 30, 1920
39. Montcalm	do	53. 0	.....	51. 0	.....	May 17, 1919	June 15, 1920

88-FOOT HARBOR TUGS.

46	Charleston Navy Yard	99. 5	.....	99. 5	.....	.....	Jan. 10, 1920
47	do	99. 5	.....	99. 5	.....	.....	do
48	New Orleans Naval Station	90. 0	.....	90. 0	.....	.....	Jan. 30, 1920
49	do	82. 0	.....	82. 0	.....	.....	Feb. 21, 1920
50	do	71. 0	.....	71. 0	.....	.....	Mar. 15, 1920
57	Vinyard Shipbuilding Co	(4)	(4)	98. 0	.....	Oct. 29, 1919	.....
58	do	(5)	(5)	99. 0	.....	Nov. 28, 1919	.....

[1] Delivered, Dec. 27, 1919.
[2] Completed, Dec. 29, 1919.
[3] Delivered, Dec. 6, 1919.
[4] Delivered, Dec. 8, 1919.
[5] Delivered, Dec. 10, 1919.

NOTE.—Percentages on 88-foot harbor tugs include machinery.

OFFICE OF NAVAL INTELLIGENCE.
NAVY DEPARTMENT.
Washington, D. C.

MONTHLY INFORMATION BULLETIN.

NUMBER 3—1920.

15 MARCH, 1920.

DISTRIBUTION:

In general: Bureaus of the Navy Department; all force commanders; all commanding officers of capital ships, the larger patrols, destroyers, submarines, and Navy transports.

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1920

CONFIDENTIAL.

OFFICE OF NAVAL INTELLIGENCE.

MONTHLY INFORMATION BULLETIN.

NUMBER 3—1920—15 March, 1920.

FOR CONVENIENCE IN ROUTING.

Officer.	Initials.	Date received.	Date forwarded.
Captain			
Executive Officer			
First Lieutenant			
Navigating Officer			
Gunnery Officer			
Communication Officer			
Engineer Officer			
Medical Officer			
Supply Officer			
First Division Officer			
Second Division Officer			
Third Division Officer			
Fourth Division Officer			
Fifth Division Officer			
Marine Officer			

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INTERNATIONAL.

POLITICAL CONDITIONS IN EUROPE.

Source: Reliable.

SWEDEN.

14 February 1920.

The Swedish press gives much space to the situation created in Germany by the demand of the Entente for the delivery of the Germans charged with wrong-doing during the war. The conservative papers in Stockholm, as well as practically all the Liberal organs, strongly condemn the Entente policy, laying particular stress on what they consider would be the results in Germany of acceding to the Allied demand. The press points out that no German government could survive if it agreed to surrender these individuals, and that the obvious result would be the coming into power of the more radical Socialist element, an immediate rapprochement with Soviet Russia, with the final result that Bolshevism would probably sweep over Europe involving neutral countries in as great suffering as the countries primarily concerned.

DENMARK.

On 11 February the Minister for Foreign Affairs introduced in the Folketing a bill for the adherence of Denmark to the League of Nations.

Denmark won an overwhelming victory in the plebiscite held in the province of Slesvig by which the future status of that district was determined. The official figures show that Danish adherents cast 75,023 votes while the Germans polled 25,087. The result of the plebiscite in the first zone excited the Germans to violence; it is reported, for example, that a German climbed to the roof of the hotel in Flensburg, where the International Commission is residing, hauled down the English and French flags, tearing the French one to pieces, and then hoisted the German flag.

By agreement between the Danish Government and the International Slesvig Commission, the former will not take formal charge of the new territory until the plebiscite in the second zone is also taken, the date for which the Commission has decided to postpone from 7 March to 14 March. As the Germans had control of all the official apparatus until their evacuation, the holding of the plebiscite on the earlier date would have worked to the disadvantage of

the Danes, who now have a fairer opportunity especially in the rural districts to work out their list of voters and to prepare their campaign.

The opinion in Copenhagen seems general that the Allied demand on Germany for the surrender of war criminals is impossible of fulfillment in its present form by reason of the practical certainty that the German Government would collapse if it attempted to arrest and deliver the persons designated.

GREAT BRITAIN.

The British Parliament was opened by the King on 10 February. For the first time since 1914, the ancient ceremony of a state opening of Parliament with all its traditional pageantry was carried out. The speech from the throne counseled patience in the passage of far-reaching reforms necessary to meet abnormal conditions. Better educational facilities, settlement of the Irish question, adjustment of coal mining controversies on an enduring basis, and the regulation of the liquor traffic were asked by King George, who also advocated the passage of measures stimulating the growth of more foodstuffs at home. He mentioned bills which would be introduced in Parliament and would deal with insurance against unemployment, regulation of working hours, minimum wages, and antidumping. He said further that he intended shortly to ratify peace with Bulgaria and Austria, and that negotiations for peace with Turkey were being pressed forward with all possible speed; that the condition of Ireland was causing grave concern, but a bill would be immediately laid before Parliament, for a better government of that country; and that bills for the post-war organization of the army and navy, for the creation of an adequate supply of cheap electric and water power, and a bill dealing with the reform of the House of Commons would also be introduced.

In the House of Commons the new session was launched with speeches by the Premier, William Adamson, and Sir Donald MacLean. who spoke for the Government, Laborites, and Liberals, respectively. No notable Irish voice was heard, although Ireland was the subject of part of all the speeches.

With reference to Russia, Lloyd-George said he agreed with the view that Europe could not be restored without putting Russia, with all her strength and resources, "into circulation," and stated that while Bolshevism might be efficient, it was not democratic, and that Russia must be restored under an anti-Bolshevist régime. He pointed out that commerce has a sobering effect, that there is nothing to fear from a Bolshevist invasion of surrounding countries or the Middle East, because the Bolshevists can not organize a powerful army, but

that trading will bring to an end the ferocity, rapine, and cruelties of Bolshevism more surely than any other method.

Alluding to Viscount Grey's letter, Baron Charnwood expressed his approval, and said that America must be allowed to choose her own path, but added that he was convinced, despite recent misleading appearances, that increasing participation by the United States in the world's affairs may be confidently anticipated. Earl Curzon, Secretary for Foreign Affairs, expressed his thanks to Lord Grey for the letter which he did not consider as savoring of interference in America's domestic affairs, and declared that although Viscount Grey had acquainted him with his intention to publish the letter, it was neither inspired by nor submitted to the Government. He said that not a word of criticism could be uttered against America; that while disappointment might be felt, America had a traditional policy which Great Britain ought to endeavor to understand and respect; that America desired to keep free from entanglements, and was the best judge of her own policy.

On the 11th, in the House of Commons, Lloyd-George, in the course of a debate on the labor amendment criticizing the Government's refusal to accept the miners' proposal for the nationalization of the coal mines, declared that if any attempt was made by labor to put pressure on the country by violence, such action would be a challenge to the whole fabric of free government. The nation has ever fought for liberty, he said, and will fight for it again. William Brace, president of the South Wales Miners' Federation, began the debate by moving an amendment expressing regret for the absence in the King's speech of any proposal to nationalize the coal mines along the lines recommended by the majority of the coal commission appointed by the Government. Mr. Brace outlined a plan for nationalization, stating that such action would not mean bureaucratic control, and declaring that his plan was not one of confirmation but of fair purchase—the Government to give the shareholders bonds for their present shares. In replying, Lloyd-George argued that it would be impossible to have nationalization without bureaucracy, and that it would be useless to establish another system unless Mr. Brace was able to prove that it would be better than the existing system. The Premier ridiculed Mr. Brace's idea that the miners would work harder for the State than for private interests, and contended that the scheme would discourage the development of the mining industry.

The debate showed no weakening of the coalition's solidarity, and the Premier's speech gave immense satisfaction as one of the best fighting speeches Lloyd-George has ever made. A Labor member has declared that the question of the nationalization of Great Britain's mines must be decided outside of Parliament in view of

the Government's refusal to act; in his opinion the country would be in the thick of a national strike within six weeks. The miners are receiving little consolation from the press over the defeat of the issue in the Commons by the vote on 11 February of 329 to 64; it is believed that Lloyd-George spoke the minds of the people when he said they would fight to the last against dictation from a privileged minority. J. H. Thomas, general secretary of the National Union of Railwaymen, predicts that the state of the world is such that unless something is done speedily a crash will come, in which no one will suffer more than the workers, and declares that the Labor Party's difficulties arise not through the cleverness of the other parties but through jealousies in its own ranks.

AUSTRALIA.

The Government has intervened dramatically in the engineers' strike. Premier Hughes has forbidden the banks to make any payments to the strikers or their unions or to honor their securities. His action has caused a sensation in both camps. The trade-unionists are greatly perturbed because the engineers were not permitted to draw upon their council accounts in the savings banks on 12 February. While the unions are outwardly inactive, there are evidences of tremendous underground activity and efforts to obtain concerted action in a fight upon the Government. In consequence of the danger of a general upheaval, the prices of foodstuffs are advancing sharply. The iron gates at the main entrance to the Government offices are said to be locked and guarded by police.

Military.

Announcement has been made of the evacuation of British troops in Batum, a Black Sea port. British forces occupied Batum and Baku in December to prevent the Turks from penetrating the Caucasus region.

British marines have landed at Penderme, the northern terminus of the railway to Smyrna, because of the recent capture by the Turks of a Turkish arms depot in Akbarh, near Chanek, on the Dardanelles. It is also reported that British artillery has been landed at Ismid, the terminus of the Bagdad railway.

The advance guard of a British battalion which will be one of the units of occupation in Danzig has arrived in that city, and the last of the German troops left on 8 February.

FRANCE.

While addressing the committee on foreign affairs on 4 February Millerand mentioned Germany's nonexecution of various clauses of the treaty, but he attached little importance to Van Lersner's de-

parture and said that the French Government would insist upon the surrender of guilty Germans. Von Lersner's departure has reopened in the French press a nationalist and militarist campaign for indefinite occupation of the left bank of the Rhine. The Premier has notified the German Government that because of nonfulfillment of the treaty terms by Germany, the time limits placed upon the Allied occupation of the Rhineland have been suspended. This action on the eve of the meeting of the allied premiers in London is interpreted by some sections of the Allied press as meaning that Millerand hopes to wrest from Premier Lloyd-George the direction of Allied policy in the enforcement of the Treaty of Versailles. France fears that the British Premier's policies will rob her of the fruits of victory, and Millerand thus serves notice that France stands upon the terms as written. In making this declaration to Germany, Millerand, who is president of the Council of Ambassadors, acted in the name of France, holding that his country's vital interests were at stake and that she was justified in protecting herself. Technically, he predicated his step upon Germany's failure to deliver the full amount of coal to France. In reality, his move is directly connected with the enforcement of Article 228 of the treaty. The Premiers, at their London meeting, will prepare an answer to Germany's plea that the accused Germans be tried by a German court. Le Temps says that a heavy responsibility rests upon Lloyd-George for having taken an attitude that may make it more difficult to crush Prussian militarism. La Liberte expresses regret that the United States did not join in the demand for the "Apostles of Kultur," and proposes means to procure from neutral countries the accused men who have fled from Germany—Ludendorff, for example, who has gone to Switzerland. This paper says: "In view of all the difficulties facing us, it is regrettable that the allies do not appear united on this question. The treaty must be enforced. Article 228 is part of the treaty. It must be enforced, or penalties must be inflicted." Echo de Paris says that Premier Millerand is energetically insisting upon the execution of the extradition clause of the Treaty of Versailles and is urging, if Germany refuses to surrender men accused of war crimes, that they be tried by default. A sensational article in the semiofficial Temps of 13 February, however, expresses a desire for a complete reversal of the French policy of ruthlessness toward Germany. The article declares that much more important matters are at stake than the fate of the ex-Kaiser and the other war culprits, and urges for these a simple trial in contumacy.

General Weygand, chief of staff for Marshal Foch, discussing the policy of the French Government and of the French General Staff towards Bolshevism, said: "I am a soldier, and as a soldier I see

that Bolshevism constitutes a grave military danger to my country. That is enough for me. * * * The French have already fought too much to undertake a new military campaign now. We can not afford a new war. When we speak of opposing Bolshevism, we do not intend to send a French military contingent to Russia. The opinion of the French Military Staff is unanimous on this point."

Georges Pallain, governor of the Bank of France, declared to stockholders that the alarming situation with regard to exchange was caused by the interruption of advances from the English and American treasuries, which had thrown the market on its own resources at the moment when the burdens of France had become heavier through purchases for industrial reconstruction. Le Journal, in commenting on M. Pallain's declaration, said the difficult situation was due to lack of financial solidarity on the part of the Allies. André Liesse, member of the Institute and editor of the weekly financial journal Economiste, pointed out that in spite of all the recommendations not to increase imports it was impossible to renounce the obtaining of raw materials, indispensable to industries and to economic resurrection, and of foodstuffs such as wheat.

LUXEMBURG.

On 7 February the Brussels morning papers announced that recognition had been accorded to the Grand Duchess Charlotte of Luxemburg. This action by the Belgian Government comes as a surprise, as Belgium has steadily opposed recognition by the Allies of the new régime in Luxemburg pending the conclusion of the economic negotiations between France, Luxemburg, and Belgium. A Belgian minister is expected to arrive in Luxemburg at an early date.

THE NETHERLANDS.

According to a press despatch the report that the Grand Duke of Hesse, his son, and several German generals on the list of persons whose extradition is demanded by the Entente, had crossed the German border into Holland has been emphatically denied, and it was learned at the Dutch Foreign Office on 12 February that Holland is taking steps to prevent the coming of any German whose presence is likely to cause trouble. The view of the Dutch Government is that the former Emperor and former Crown Prince, who are already in The Netherlands, are entitled to such protection as the Dutch law requires, but that the country does not desire the presence of any other German war leaders.

In the meanwhile, the press is showing more apprehension over the question of the extradition of the ex-Emperor William and there is a growing feeling that protracted and delicate negotiations concerning him may be expected.

Troelstra, spokesman of the Dutch Parliamentary Party of the Socialists Democratic Labor Party, declared in Amsterdam recently that the Russian armies, like those of the French revolution, might attempt to carry the red flag through Europe by force of arms. Entente pressure, he said, implied that, while he would prefer to see socialistic ends achieved peacefully, he would not shrink at violence if that proved necessary.

GERMANY.

The German press is still chiefly concerned with the question of the extradition of war criminals, and the determination appears to be growing to stand firmly against this demand in spite of the clause in the treaty authorizing it. Erzberger says, "Come what may, neither I, myself, nor any member of the present cabinet will lift a hand to carry out the allied extradition demand, because it is wholly impossible." It is said that the Bavarian, Baden, and Saxon cabinets have threatened to resign if the federal government yields. Various meetings of protest have been held by the officers' league and by student organizations. For example, 4,000 students of the University of Berlin held a meeting of protest in which they voted to protect the persons demanded with their own bodies if necessary.

In the meantime the Dutch Government is taking steps to prevent those on the list from seeking asylum in Holland. Switzerland also is equally worried over the situation, since various war criminals have already arrived in that country.

Only the Independent Socialist papers dare to take any independent stand, and they do not admit the possibility of extradition for trial by the Allies. Freiheit, for example, points out the disgrace of the nationalist agitation and urges the immediate prosecution of war criminals before the German court at Leipzig. Other Independent Socialist papers state that the question of extradition is not debatable, since Germany has signed the peace treaty, and that no party can permit a nation of 60,000,000 to be sacrificed for the sake of 800 men, whereas hundreds of thousands offered their lives for Germany during the war. These Independent Socialist papers urge that a trial be held at the Hague, the alleged criminals to be defended by neutral advocates.

A meeting of army and navy officers was held a short time ago in which it was decided that all should refuse to surrender to the Allies for trial.

It is said that the prepared lists of the various members of the allied nations were handed in separately in Paris, and from these demands a general list was made and that on this list many names appear which have not been considered in the past. Great Britain, France, Italy, Belgium, Poland, Roumania, and Jugoslavia, in pre-

senting their lists give reasons for the names included, and these reasons are of real interest. The British, for example, take no account of cruelty in battle, but make a point of accusing high officials for promoting policies of destruction contrary to the laws of war. This is the reason for including von Tirpitz, Capelle, Hipper, and Scheer, who are stated to be responsible for the ruthless submarine warfare. Ingenohl is held responsible for the bombardment of unfortified British seaport towns in 1914. Various individual submarine commanders are named, and von Schroeder, a former admiral in command of the naval forces of Flanders, is demanded for the murder of Capt. Freyett. The other principal division of the British list is composed of commanders of prison camps in various parts of the world. Great Britain also demands the surrender of nine Turks, if they happen to be in Germany, as responsible for the Armenian massacres. This list includes Enver Pasha, who is now in the Near East.

The French list gives individual officials with the specific acts for which they are held responsible. Among these are Von Kluck, Prince Rupprecht of Bavaria, the Crown Prince, Prince Eitel Friedrich, and Prince August (sons of the Kaiser) all of whom are wanted for theft and for ordering their troops to pillage and destroy the villages they were abandoning. Von Hindenburg and Ludendorff are held responsible for the systematic destruction of villages and fields and for organizing battalions of civilian workers. Some 20 civilians are included in the list, charged with the systematic looting of French factories at Lille and Douai, which the Germans hoped would destroy the cotton and woolen spinning industry in France. France, like Great Britain, demands various prison camp commanders and officials.

The Italian list is made up principally of submarine commanders and prison-camp officials. The Belgian demand includes Prince Oskar, the fourth son of the Kaiser, for the atrocities at Ethe in August, 1914. Bethmann Hollweg is held responsible for the deportations of August, 1916. The Polish demand included 51 individuals, most of them guilty of looting and extortion during the German occupation. Both Roumania and Jugoslavia demand Von Mackensen, who is accused of giving orders for looting and general destruction.

Deducting duplications, 854 names were listed. The demands made were divided as follows: Great Britain, 95; France, 334; Italy, 29; Belgium, 334; Poland, 51; Roumania, 41; Jugoslavia, 4.

The economic situation in Germany appears to be growing more serious and also to be closely connected with politics. The Minister of Economy has called a food conference to discuss appeals from

the agrarians' and consumers' organizations for the elimination of compulsory control of the 1920 harvest.

The nonproductivity of labor is reported by the Prussian Railway Administration to be the cause of a serious falling off in the number of serviceable locomotives; this situation will be made more difficult through the general strike declared in the iron and steel industries in Solingen. Not much is yet known of this strike, since the newspapers in that section have been unable to appear on account of a printers' strike.

One reason for the lack of supplies and the fall in the value of the mark is said by Foreign Minister Mueller to be the fact that Germany has already paid to the Allies the equivalent of 36,700,000,000 gold marks in reparations. It is not known exactly what the minister refers to as the "equivalent."

AUSTRIA.

Austria continues to carry on largely through outside charity. No definite arrangements have been made for a final settlement of the extremely complicated Austrian difficulties. The Food Minister said on 15 February that, including two shiploads of 11,000 tons, which is the total of the grain purchased from the last funds of the $48,000,000 credit and which is due in Trieste shortly, Austria can supply bread until the 1st day of March, but probably not longer unless already insufficient rations are further reduced. In the meantime supplies are coming in from the outside in the form of charity, but naturally not in amounts sufficient really to relieve the stringency. One of the latest gifts is a fund of 40,000 kroner raised by the students of Stockholm for the relief of suffering Vienna students. Arrangements have been made, furthermore, to accomodate a number of Austrian students in Stockholm during the month of March, and large numbers of children are going out of the country to live temporarily in Italy and also in the Scandinavian countries.

The Ministers of Food and Finance have requested the Council of Ambassadors to permit the Reparations Commission to begin work at once in order that Austria may arrange for a loan. They plan to ask credit sufficient to provide for the country until October and to secure a long-time loan either public or private. It is obvious that the duties of the Reparations Commission will not be to exact reparations payments from Austria but rather to furnish Austria with the means of subsistence.

The Austrian Government is requesting that certain financial and commercial representatives be allowed to come to the United States for the purpose of reorganizing trade and of securing if possible private credit for the import of raw material. In connection with

this it is interesting to note that 24 delegates of the Austrian Chamber of Commerce are now in London for the same purpose. This visit, although not recognized by the British Government, was arranged with the knowledge of the British Trade Commission in Vienna. The delegates expect to remain in London for about three weeks.

Certain American firms are said to have expressed a desire to purchase magnetite for export. The possibility of this, however, is entirely dependent upon the coal supplies which must come from Czechoslovakia, and it is said on good authority that the Government in Prague is willing to furnish coal only in sufficient quantities to secure magnetite for its own use.

Politically, the tendency toward decentralization becomes more pronounced. A conference of provincial representatives is now meeting in Salzburg to discuss a new constitution. This conference will demand an autonomy for the Provinces which is practically independence, and which will make Vienna a state separate from Lower Austria. The reason for this is, of course, that the country districts of Austria wish to have little or no responsibility for the support of the capital city.

It is reported that a list of war criminals to be delivered by Austria will be submitted at an early date. This list is said to include Archduke Joseph, Count von Berchtold, and several military officers of high rank.

HUNGARY.

It is said that Archduke Joseph has published a statement that he will under no circumstances consider assuming the leadership of the Hungarian Government. There is in consequence considerable discussion concerning the possibility that Admiral Horthy will consent to become the head of the new government. Admiral Horthy has behaved well during all the negotiations and, although a conservative himself, has prevented the excesses against the Jews and the Bolshevists which were feared.

The Hungarian Government has notified the Interallied Military Mission that, anticipating the retirement of Roumanian troops, 5,000 Hungarian troops have been sent to the Theiss River to preserve order and to occupy the territory vacated by the Roumanians. This reoccupation is to be supervised by three officers of the military mission.

ITALY.

All the elements which constitute the Adriatic problem, as well as its various aspects and subordinate details, are for the moment overshadowed by the President's note transmitted to the British and

French Governments on 13 February. Statements in the press assert that the President notified the British, French, and Italian Governments that if they settle the Adriatic problem without the concurrence of Washington, the United States would not concern itself further in the settlement of pending European questions. Italian circles in London were reported to be greatly disturbed over the note, as was the Italian public over the report earlier in the week of the negotiations between France and Jugoslavia last fall by which, it was said, a community of interest between the two countries would be recognized in the Adriatic. These new developments will probably affect Premier Nitti's position. He is now backed by a big parliamentary majority, both in the Senate and in the lower chamber, which is in favor of settling the Adriatic question by compromise instead of insisting on the enforcement of the secret compact of London, as it is called in Rome. Hitherto the bulwark of political opposition in Italy to a compromise has been, as Nitti is careful to point out, the supposition that, in applying the secret treaty of London to the Adriatic coast, Fiume could be left out with the reserved right of self-determination. Such modification as the political opinion of Italy has lately undergone on the Adriatic question is the outcome of Nitti's refusal to countenance what he himself has termed the "absurd thesis" of the Adriatic as a purely Italian lake, and even more clearly has he given Parliament to understand that the bona fide execution of the Treaty of London would make it necessary for the Italian Government to take the initial step in securing the evacuation of Fiume and the assignment of the city to Croatia.

The reported negotiations of last fall between France and Jugoslavia mentioned above, became known through two secret documents, published on 11 February in Idea Nazionale. These were said to have been exchanged last week between the Serbian and French Governments. In one document Serbia proposed to France a military convention as a basis for a definite alliance; in the other, France responded sympathetically, but with reservation. The Serbian document, dated 30 September, declared that Belgrade was convinced that Jugoslavia needed the friendship of France to guarantee her outlets on the Adriatic and pointed out that this would insure to France "free action on the Dalmatian coast in the event of war with a Mediterranean power." Serbia's plan provided that she would aid France with troops and ships in the latter contingency, while France would help to build a Serbian fleet and mercantile marine. It was stated that in reply to the Serbian proposal, France stipulated that a commercial agreement must precede a military convention, and required radical modifications in Serbia's proposal. Idea Nazionale further

states that as a result of these negotiations France and Great Britain presented the recent memorandum to Italy on the Adriatic question, which includes the compromise accepted by Nitti. In the opinion of Idea Nazionale, this delivers to the Jugoslavs the entire eastern coast of the Adriatic and shifts the Italo-Jugoslav boundary from the Alpine zone, as traced in the Pact of London, to the zone of the Carso Mountains. Premier Millerand is said to have given to the Supreme Council in London a satisfactory explanation of these reported negotiations.

There are many rumors of troop movements in the Trentino and toward Dalmatia. These reports continue with notable persistence. Considerable military forces are apparently being concentrated in the vicinity of Trieste. Military circles at Trieste believe that these dispositions are taken with the intention of enforcing if necessary the compact of London. In the meantime, advices from Fiume announce that preparations are being made for resistance against a compromise settlement of the Adriatic dispute or the execution of the Treaty of London. It is declared that foreigners will be expelled from the city, if necessary. Lieutenant Commander Rizzo, who formerly commanded d'Annunzio's navy but disagreed with the poet over the annulment of the Fiume plebiscite at the end of December, has returned to Fiume to take up his old duties. It continues to be reported that the Arditi in Fiume commit every day new acts of violence. It is said to be dangerous to cross certain parts of the town during the night as the soldiers are continually firing machine guns and exploding hand grenades. It is also reported that d'Annunzio has on his staff several notorious anarchists. Some of his soldiers, disguised as a train crew, recently seized in San Pietro del Carso a food train en route from Trieste to Vienna for the Italian mission. An Italian destroyer, en route from Brindisi to Pola, was seized by the naval forces of the Fiume government on the night of 6 February.

The Chamber of Deputies continued on 6 February its discussion of the Cabinet's foreign policy. Bevione, a Nationalist, defended Sonnino who, he said, concluded the compact of London when it was impossible to foresee a dissolution of Austria. Deputy di Cesaro, speaking on the Adriatic question, attacked Nitti's policy. He asserted that Nitti compromised the Fiume question in representing Italy as being on the point of bankruptcy and unable to resist. In support of this charge he read a telegram which he said Nitti had addressed to the American Secretary of State on 21 October, 1919. The telegram contained an appeal to America with a view to securing approval for the annexation of Fiume and stated that it was useless to entertain illusions about the gravity of the situation in Italy, as

the nation had reached the extreme limit of resistance. Refusal of Italian aspirations, the message declared, might lead to revolution.

Nitti, in a speech to the Senate before his departure for Paris on 9 February announced that he was certain that Europe could not expect any more financial assistance from America. Consequently Italy must be prepared to stand alone. The Premier said that the life of the country had not been interrupted by the recent strikes and that the Government's object was to raise up the country by peaceful work. He explained all the great reforms by which it was hoped to win over the masses to the State and announced that drastic measures restricting consumption would be initiated. He declared that economic difficulties instead of decreasing were becoming greater. The situation was graver because the American Treasury Department had affirmed the determination of the United States to detach itself from European affairs; but he declared that Italy's problems could be solved by hard work and submission to discipline. To this end it was necessary to put a stop to strikes, which paralyzed the great forces Italy possesses—those of labor—and he concluded by stating that the loan, which would amount to about 20,000,000,000 lire, would enable the Government to reduce the paper currency and thus make the people abroad understand that Italy was determined to pay its debts.

The selection of Robert Underwood Johnson, of New York, to succeed Thomas Nelson Page as ambassador of the United States to Italy, was announced at the White House on 11 February.

The Prince Regent of Serbia has signed a decree initiating diplomatic relations with the Vatican. The former second secretary of legation to the Quirinal is accredited as minister.

Two hundred thousand men employed in chemical factories, including 60,000 workmen in pharmaceutical plants, are on strike at Milan. At Florence the glass workers went on strike on 10 February after a rejection of their demand for higher wages.

MEXICAN NOTES.

Source: Reliable.

31 January 1920.

In the Mexican press of the 14th both the Japanese Legation and the Mexican Foreign Office denied a rumor that the Mexican Government has celebrated a secret treaty with Japan, and that the Japanese cruiser *Yakumo*, which brought the Japanese naval students to Mexico, carried a cargo of war material for the use of the Mexican Government. The marines are reported to have left Mexico after warm receptions in Guadalajara and Manzanillo, their point of departure.

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The Mexican press has contained considerable criticism of the lavish entertainment tendered to the Japanese, which is qualified as exaggerated and imprudent.

The municipal government of Guaymas, Sonora, is reliably reported to have recently augmented the taxes of several Chinese commercial houses, the appeals of the latter for reduction of the new taxes imposed having been rejected by a unanimous vote of the council.

The Mexican press of 27 January published an interview with the Acting Secretary of Foreign Affairs to the effect that although the latter is not in possession of all the information in regard to the present judicial status of the Jenkins case he is of the opinion that all international difficulties growing out of Mr. Jenkins's abduction have been dissipated.

Renewed difficulties between the United States and Mexico will apparently result from the action of the Federal Government in endeavoring to secure all foreign-owned property within 100 kilometers of her borders. The amount requested for the indemnification of the owners is 50,000,000 pesos, and the amount estimated for expenditure in Lower California is said to be 25,000,000 pesos, whereas the amount offered by Japanese interests for the American-owned Otis-Chandler interests was 40,000,000 gold, alone.

Advices from Copenhagen indicate that there is to be a great Bolshevist offensive in the spring, Poland being the first point to be attacked in April. It is asserted that this offensive is to be accompanied by revolutions in Mexico, Japan, China, and other countries.

It is reported, but not officially confirmed, that General Juan Barragan, Chief of Carranza's Staff, has been designated to undertake an extended trip through South America with a view to fostering military relations between Mexico and the countries he visits. He will purchase ships in Chile, it is alleged, and will visit Argentine and Brazil, sailing from Salina Cruz, Oaxaca, on the gunboat *Guerrero.*

Attorney Hilario Medina, Sub-Secretary of Foreign Relations, made the following statements to the Mexican Press regarding his opinion on the Committee for the Investigation of the Mexican question:

"Some Mexicans have been called to testify before the so-called investigating committee of the United States Senate, and whether because of a lack of knowledge of what the action of that committee means to Mexico, or for any other reason, they have shown a willingness to testify, the Department of Foreign Relations, therefore, considers that it should call the attention of all Mexicans residing in the United States, and of the public in general, to the true nature of said committee, and what it signifies to Mexico from an international viewpoint."

"The so-called Senate investigating committee seeks to establish itself as a tribunal to judge the Mexican Republic, a free and independent nation, in relation to matters pertaining exclusively to its internal affairs. Neither the Mexican Government, nor any public official, nor any person resident within or without the Republic, can or should concede any jurisdiction or authority to the said committee to make this kind of investigation, inasmuch as the Mexican Republic, from the point of view of international law, can not be judged in any manner; and the responsibilities for the acts of its Government or of its representatives are subject to other rules than those which govern the trial of an individual, which can not be the same as those applicable to an entire people, whose majesty, honor, and dignity should be scrupulously respected by all the other peoples of the earth."

"Again, the so-called investigating committee opens the way by its procedure to truly hostile acts toward a country which, like Mexico, sustains friendly relations with the United States, and it is a cause of offense to the good name and reputation of Mexico; because, in view of the facilities afforded by the said committee to the enemies of Mexico, the latter do not hesitate to slander her and harm her in her prestige and moral dignity. No Mexican worthy of the name should consent to contribute to these truly hostile acts, which tend to prepare public opinion in the United States for certain purposes ignored by none. It is a fact that interventionist elements in that nation decided upon the formation of that Senate investigating committee, with the end in view of taking advantage of the series of accusations which the said committee is collecting against Mexico in order to prove that it is necessary to intervene in our internal affairs. The Mexicans who may have contributed with their testimony toward the collation of this information, which in turn will serve as a basis for the commission of a hostile act toward the Republic, do unquestionably commit the crime of treason to the country, and this is what this department desires to warn them about in a public manner, so that in the future they may not consent to testify before that committee, which, on the other hand, has no power to force a foreign citizen to testify against his own country; and even in the extreme case that some Mexican should be made to suffer for refusing to testify before a tribunal whose competency is not recognized by any law of the United States, nor by any principle of international law, he should, if necessary, undergo such punishment in preference to violating his prime duty of respecting and demanding respect for the good name of his country, a place in the world. From another point of view, it is easy to believe that the said committee is not inspired by an idea of friendship toward Mexico, but, on the contrary, its acts are dictated by

an open hostility toward the present laws and institutions of our country. The Mexicans who, knowing that the said committee is so acting and notwithstanding assists it in furthering its purpose, most certainly contribute toward the causing of the injuries which must follow upon the investigation of matter relating exclusively to the internal affairs of Mexico; and such acts are in opposition to the firm desire of the Government to permit nothing to stain the good name of the Republic."

"Based on the foregoing consideration, this department believes that the conduct of Mexicans residing in the United States, should be guided by the following:

"Any Mexican who received orders to appear before the so-called American Senate investigating committee, for the purpose of testifying in connection with circumstances connected with Mexico, should reply, refusing to recognize in that committee authority or jurisdiction to investigate matters relating to the Mexican Republic, and he should refuse absolutely to testify. He shall inform the Mexican consul of that place or our embassy in Washington concerning the order, so that the consuls or the embassy may act in accordance with instructions given them by this department. If, because of his refusal to testify, a Mexican suffers arrest or any other penalty, he shall oppose it by means of the resources afforded by the laws of the United States, giving immediate advice of his arrest or other molestation suffered by him as a result thereof, to Mexican consuls or to the embassy, in order that appropriate representations be made."

Two American aviators, Lieutenants Davis and Grimes, who were caught in a fog while flying up the Rio Grande River on 28 January, and following a tributary of the river into Mexico, were forced to land because of exhausted supplies near Guerrero, Tamaulipas, are reliably reported to have been released by Mexican authorities.

The Mexican press of 21 January publishes a signed statement made by General Candido Aguilar, Governor of the State of Vera Cruz and until recently Secretary of Foreign Affairs, in which he discusses at length the objections to the election of a military candidate to succeed to the Mexican presidency, invites his followers to support him in his determination to exert all his efforts to secure the election of a civilian presidential candidate, and announces that the platform of the party he leads in Vera Cruz is "peaceful transfer of power; in favor of governors who are civilians by origin and training; the elimination of military governors and politicians, and complete subjection of the army to civil control."

This statement derives added significance because its author is himself a division commander of the Mexican Army (now on leave), and son-in-law of President Carranza; these facts are reasons for

inferring that his statement is inspired, and that his intention is to support Ambassador Bonillas for the presidency, since he is the only civilian candidate for that position who has been suggested to date.

General Luis Caballero, the ex-rebel recently granted amnesty, is reliably reported to have been promised a considerable sum of money by the Federal Government on condition that he leave for Havana until after the presidential elections.

According to information from Mexican official sources, under date of 14 February, 1920, the Mexican Government has appropriated $2,000,000 for the establishment of two munitions plants. Artillery and war supplies will be manufactured exclusively for the Mexican Government. One plant will be at Mexico City, the other in Durango City.

According to reliable reports it is alleged that the Government of Mexico has signed a contract for the shipment of munitions machinery from Germany with a representative of the Krupp Works. It is said that the shipment is to be made immediately and that the machinery will have a capacity of 200 rifles every eight hours.

It appears that there is considerable discontent among the troops of the Bravo Division, because of their receiving their pay in paper money. There has been a second payment in currency, and it is believed that trouble will arise.

The S. S. *Esperanza* arrived in Tampico with a reported consignment of ammunition amounting to 2,000,000 cartridges and a shipment of machinery to be used for the loading of cartridges. It is stated that ultimately the shipment was destined for the rebels.

Economic.

The prevalent opinion of the Mexican press seems to be that the paper money issued by the Government, through the Monetary Commission, to relieve the change shortage, has been a complete failure in the small retail business of Mexico City which deals in the commodities needed by the public.

The Mexican papers of 3rd February announced that the Government has taken its first step toward making the circulation of this money compulsory by requiring merchants to post signs stating whether they are willing to accept it or not. It is also reported that the Government will coin 600,000 pesos additional in copper coin.

The commercial buying rate of exchange for New York drafts has been approximately 50¾ cents United States currency per Mexican pesos during the week closing 3 February.

It is stated by the official in charge of the emission of currency in an interview published in El Universal, Mexico City, 29 January, 1920, that 150,000 pesos in half-peso notes have been placed in cir-

culation. Before this emission, there were in circulation 40,000,000 pesos in silver pesos, half pesos, 20-centavos pieces and 10-centavos pieces. It was stated further that if the proposed issue of 25,000,000 pesos worth of paper is not sufficient to supply the demand for fractional currency, a new issue and a new limit, even up to 100,000,000 pesos, will be authorized. The Secretary of Treasury denied that the Government is minting or will mint silver coins while the price of the white metal remains as high as it has been. The coinage of copper pieces (new coins of 10 and 20 centavo denominations) has reached 300,000 pesos up to the present.

In connection with the foregoing statements, it is to be noted that although the new issue of fractional currency is not nearly sufficient to meet the demands of trade, and while it is acceptable by the larger business houses, it is refused by small dealers in the market places to such an extent that it is questionable whether the circulation will be continued.

There has been in the past keen rivalry in Mexico to secure American goods in various lines at almost any price, and on any terms. Owing to the peculiar conditions imposed by the war, this trade has been acquired with little effort on the part of American exporters, who have been independent, even exacting, with regard to conditions of payment.

Terms demanded by European houses have, as a rule, been more liberal than those exacted by Americans. British importers, in dealing with responsible Mexican houses, allow trade discounts, 4½ per cent interest being charged on unpaid balances. In dealing with smaller concerns the shipper drew against shipping documents.

French trade with Mexico has been more generally conducted through resident agents. French firms control the principal dry goods houses in Mexico and are heavy importers from the home country. The French employ the same credit system as the British, and a large trade in brandies, wines, and other liquors is carried on with France, six months' credit, or even more, frequently being allowed.

Mexican imports from Germany had assumed large proportions before the war, but the methods employed in seeking trade differed radically. Agents and direct representatives were established in Mexico City and travelers covered even the remote interior districts. Direct sales were made to houses both large and small, and credit for a term of from six months to a year was freely granted. German trade was active, principally in hardware, both heavy and small toys, drugs, chemicals, leathers and shoemakers' supplies, machinery, and electrical goods.

Indicative of German plans to make a strenuous fight to regain interrupted trade with Mexico is the emphasis placed by German propagandist agents upon the benefits which will redound to Mexico

when articles of German manufacture are again on sale in Mexico. Germans have used every means in their power to retain their trade and still further to expand business relations as soon as they can once more import goods. There is evidence to show that the Germans are making plans to enter new commercial fields in Mexico, including mining and the important oil industry, which heretofore they have not touched. A German-Mexican society for the promotion of cultural relations between Germany and Mexico has been founded in Munich and the plans of the society include the organization of local groups throughout Germany. The management is intrusted to a business council that has been established and at work for some time.

While recent American export business with Mexico has been acquired on whatever terms shippers have required, it has not been secured without engendering some resentment on the part of important business houses in Mexico that felt a reproach in being denied customary terms and credit.

With reference to the paper money to be issued by the Monetary Commission in order to relieve the shortage of change throughout the Republic, it seems that the emission of this currency has been delayed on account of the scanty printing facilities of the Government. It is apparently the general opinion of the Mexican press that this measure will fail on account of the fact that the small merchants and the lower classes in general will not accept the new currency, due to the experience which they had in the past in connection with this class of specie. It is likely, however, that the paper money will drive practically all gold and silver out of circulation, and in this event its circulation will be forced upon the country.

Owing to the unprecedented rise in the value of silver, there has been much smuggling of Mexican silver fractional coins into the United States, the bullion value of the silver coinage being in excess of its face value. El Paso, Tex., is asserted to be the principal port of entry for this contraband, there being shipments to the approximate value of $1,346,500 in silver coin going through that port and gold coin valued at $62,000 since the first of the year.

This is asserted to be the inevitable consequence of the lack of Mexican paper money in circulation, and is due also to increasing transactions in various parts of the Republic which necessitates the use of American money to supply the deficiency of the Mexican circulating media, and to supplement in payment for exports from Mexico. Another cause of the extensive use of American money in Mexico is the innumerable commercial transactions at frontier points, on the coasts and in the oil field where American gold predominates.

The American press reports that Sr. Luis Cabrera, Secretary of Hacienda, has asserted, when referring to the recent presidential decree authorizing the granting of provisional drilling permits to foreign oil companies, that the decree paves the way to a complete and amicable settlement of the oil controversy between the United States and Mexico. He is alleged to have further said that Mexico will insist upon the principle of national ownership of subsurface rights, and if the oil men will agree to this principle discussion as to its application with regard to vested interests, may proceed.

Commenting on the granting of provisional drilling permits to American oil companies by the Mexican Government, Excelsior of 21 January, states that the American Association of Petroleum Producers in Mexico, which has always disregarded the Mexican Government to the extent of not having addressed to it a single communication, has at least given in, and has spontaneously agreed to observe all laws and orders provisionally given in the matter of petroleum. The article adds that Mexico has won a victory in the defense of her laws and has recovered her place as a free and sovereign country. It is stated that the Mexican officials immediately in charge of petroleum questions in the Department of Commerce and Industry, are indicating a willingness to make certain concessions to the petroleum companies, such as full recognition for a period of 30 years, of vested rights acquired prior to 1 May, 1917, with the right to exploit without hindrance, properties so acquired, but that principle of nationalization of subsoil rights is to remain unchanged.

By instructions of the President numerous concessions have recently been granted for the exploration of oil deposits believed to exist in various portions of the republic. Eight different permits have been granted for development work in the vicinity of Mapimi, a well-known mining camp in the State of Durango; 16 for work in and about Casas Grandes, State of Chihuahua; 11 in the vicinity of the border city of Juarez, and 3 for the region opposite Columbus and Presidio, on the new Mexican border, according to the Mexican Review, the semiofficial Carranzista organ.

The annual report of the Mexican Petroleum Co. and its affiliated organization the Pan-American Petroleum & Transport Co., as just made by E. L. Doheny, president of both companies, shows a net profit, over charges and war taxes, of $6,699,444.

The Pan-American Petroleum & Transport Co. shows a net profit, over charges and war taxes, of $4,666,727.

Announcement has been made in the Mexican press that Huasteca Petroleum Co. is about to commence operations in the construction of a pipe line for conveying petroleum from the Tampico region to the City of Mexico, in accordance with the terms of its concession obtained from the Diaz government in the year 1908.

The proposed line will commence at Cerro Azul, where the Huasteca Co. has some of its largest wells, and will ascend to the Central Plateau and pass through the various industrial centers of that region before reaching Mexico City. It is proposed to establish an extensive refining plant there. The estimated cost of the work is upward of twenty millions of pesos.

A contract has been entered into by the Secretary of Agriculture and Development with the Rio Bravo Agricultural Co. for the irrigation and colonization of 25,000 hectares (62,500 acres) of rich agricultural land in the northern portion of the State of Tamaulipas.

There are at present four refineries working at Tampico, one at Tuxpam, another in Vera Cruz, and last, the oldest of them all, in the town of Minatitlan of the State of Vera Cruz.

The Texas Co. of Mexico is about to start refining its oil in the plants it established at Tampico and Lobos.

The refinery of La Atlantica Oil Co. is about finished and it may start working the early part of this year.

The total capacity of the refineries built up to the present in the Mexican oil fields is approximately 14,300 cubic meters—that is, 90,000 barrels per day. Twenty-two per cent of the oil now exported goes out already refined.

The Oil Bureau, a branch of the Department of Industry, Commerce and Labor, is asserted to be following a program containing the following fundamental points:

First. To obtain the nationalization of the oil beds and other hydrocarbon existing on the soil and in the subsoil of the national territory.

Second. To see to the development of the national oil industry by giving great facilities consistent with Mexican laws and the guaranties and protection due to the general interests of the Mexican people.

Third. To see to the preservation of the natural resources of Mexican soil.

Fourth. To carry on a work of propaganda of all the data concerning the oil industry in order to draw it to the attention of Mexican investors and Mexican industrial people, professional and workmen.

For the 10 months ending October, 1919, the exportations of silver from Mexico to the United States is said to have amounted to $51,233,802, while for the 10 months ending October, 1918, the silver exportations were $43,471,809.

The Huasteca Petroleum Co. and the Penn-Mex Fuel Oil Co. have plants where the gasoline will be taken from the gas, thus utilizing a good portion of it which would otherwise go to waste, and the latter company has applied for permission to establish one more

of such plants in its cantonment "El Alamo" in Tuxpan, Vera Cruz.

It is announced that work is soon to commence on a new railway line from the interior of Texas and connecting with the principal roads traversing that State, with its terminus at Brownsville, opposite Matamoros. This line will be operated in connection with the one that is projected from Matamoros to the oil regions of Tampico, and will afford a ready and direct means for transporting petroleum by land from the latter point, something that has so far been done upon only a moderate scale. The principal object of the construction notes is to supplement the present shipping facilities, which are at present entirely inadequate to handle the oil production, which is only a little over 10 per cent of the potential production of the wells already in existence, while the new ones are being sunk in every direction and the potential production is being augmented steadily.

The latest available Mexican statistics show that for the month of October there was exported from Mexico to the United States $6,060,765 in silver bullion, against $5,185,554, for the same month in 1918, while for the ten months ending October, 1919, the exportations were $51,233,802, as against $43,471,809 for the preceding year.

For the year 1918 the value of the oil exported from Mexico was $70,278,776 and the total amount of duties paid by exporters to the Mexican Government was $5,560,198. The total value of the shipments for 1919 can not now be given, but the duties will approximate $7,400,000, according to semiofficial reports.

Thirty vessels of armored cement have weighed anchor in Liverpool on their way to the Mexican coast; they will carry petroleum for France, England, and Belgium. Likewise and with the permission of the English Admiralty five vessels have left German ports to carry mineral oil. The early arrival of South American vessels is also expected. This is the most important commercial movement in the branch of petroleum that has been recently observed.

Only American, French, and British naval vessels are asserted to have visited the port of Mazatlan, Sinaloa, during the past two years, with the exception of the recent visit of the Japanese vessel.

Mexican custom authorities on the border have reported that since the adoption of prohibition in the United States, there is growing up a constantly increasing traffic in the smuggling of opium from Mexico.

The Mexican Government has given orders to the frontier officials to exercise special vigilance toward the suppression of illegal and nefarious traffic.

A large number of Portuguese who are engaged in vineyard cultivation and wine making in California are investigating with a view to going to Mexico and resuming their occupation.

They desire to remove their plants to Mexican territory establishing them so near the boundary line that the fruit from the wine-grape vineyards can be shipped thither in refrigerator cars and there converted into wine, which will be used in Mexico and for export.

The number of claims for revolutionary indemnization presented to the special commission in session in Mexico City is constantly augmenting. At the latest report the total amount presented by foreigners was $17,747,498.81, and by nationals, $9,179,798.08, or a total of $26,927,296.89.

The commercial buying rate of exchange for New York drafts has been approximately 51¾ cents United States currency per Mexican pesos during the week closing 20 January.

Several Mexican papers of 18 January reported the arrival in Mexico City of Mr. Charles B. Brightman, the head of a powerful corporation in London, who intends to invest $1,000,000 in the acquisition of petroleum lands in the republic.

According to the press, the Ward Line has informed the management of the Mexican railways that, beginning with the 1st of January, this company will inaugurate a steamer service between the principal ports of Mexico and Europe.

EUROPEAN NOTES.

Source: Reliable.

7 February, 1920.

The Bolsheviks insist that the terms of the treaty concluded with Esthonia refute the charge that they plan imperialistic wars against Poland and India.

The complete domination of the Cooperatives by the Soviet Government is shown by the appointment of Litvinov as chairman of the Cooperative delegation to be sent out from Russia.

There is growing evidence of British anxiety as to the Soviet plans against India.

Russia.

Peace was signed 2 February between Soviet Russia and Esthonia. Esthonia obtained independence, freedom from Russian pre-war debt, 15,000,000 roubles in gold, forest concessions in Russia, and a concession for construction of Esthonia-Moscow railroad. Soviet Russia obtained free harbor space in Reval and electric power from Narva Falls, a guaranty against any further attacks through Esthonia of White Russian forces, and immediate resumption of commercial relations.

The Pravda of 4 February published an appeal from the Soviet Central Executive Committee disclaiming any intended Bolshevist offensive against Poland, and asserting that the Soviet Government

desires to make peace with Poland. The New York Call of 7 February published an interview with Litvinov in Copenhagen to the same effect.

On the other hand, intercepted wireless messages from Moscow, and the most recent Bolshevist newspapers which have come through to the United States, contain repeated appeals for world revolution and the World Soviet Republic.

During his stay in Copenhagen, Litvinov is said to have been carrying on vigorous commercial propaganda and to have promised concessions to Swedish bankers and business men.

Odessa was retaken by the Bolsheviks on 7 February.

Denikin's staff believe a section of the German General Staff is in Moscow and that it may be responsible for the constant un-Russian strategy employed by the Red armies. There are said to be small groups of German-Austrian ex-prisoners serving in the Red Army.

On 6 February General Denikin was reported as resolute in the face of defeat and as determined as ever to establish a United Russia.

At a recent conference of proletarian authors at Petrograd, Evidokirov said: "The fight against the bourgeois poison * * * will have to be continued for a long time yet."

Russian workmen are said to be doing extra work on Saturdays without pay in order that the money which they would otherwise receive may be used for Bolshevist propaganda abroad.

A new Russian Free People's Church headed by Vladimir, archbishop of Penza, is reported to have been organized to work in close cooperation with the Soviet Government.

J. Vladimir Bienstock, a Russian journalist writing in L'Eclair, stated that Bolshevism in Russia is evolving and tending to disappear, being replaced by reactionary militarism. He claims there is a formidable army under iron discipline, officered by reactionary Russian generals as well as by German generals, and that German technicians are in charge of many Russian industries.

United Kingdom.

The London Evening Telegraph of 30 January stated that Lloyd-George is about to propose to the miners that a referendum be taken on the question of nationalization of coal mines.

France.

A number of French newspapers were quite outspoken in their criticism of the decision of the Supreme Council to trade with Soviet Russia. L'Echo de Paris of 17 January contained a signed article by "Pertinax" stating that the decision was due to English radicals, international financiers, and Manchester free traders.

Le Petit Parisien of 19 January stated that the new policy redounds wholly to the profit of England, and involves the recognition of Soviets, in return for which no concession was asked of the Soviet Government.

On 6 February the Socialist leader, Marcel Cachin, interpellated the Cabinet as to its Russian policy, insisting on peace with Soviet Russia and pointing to the example of the United States in withdrawing troops from Siberia.

Extensive strikes, particularly among the railroad workers and miners, were threatened for the middle of February.

Bolshevist pamphlets by Sedoul are being widely distributed by L'Association Republicaine des Anciens Combattants. Its leaders, many of whom are Jews, are reported to boast that their organization will be the only one which can bring about a revolution. There is said to be a dangerous unrest among the French State employees, who have not as yet received the increase in salary awarded last July.

The School Teachers Friendly Societies, numbering 20,000, have decided to transform themselves into unions and to ask affiliation with the Confederation Générale du Travail.

Sweden.

The labor situation and strikes are causing great uneasiness because of the fear that the Socialists may come into power.

The Swedish press insists that the German Government could not survive the surrender of the German war criminals and that the obvious result would be the coming into power of the Communist element and an immediate rapprochement with Soviet Russia, when Bolshevism would sweep over Europe.

Höglund, Swedish Bolshevist leader, is said to have visited Litvinov secretly at Copenhagen and returned with a supply of propaganda.

Norway.

There are said to be 30,000 Communists in Norway. Communist literature is brought in mainly from Germany. Kramer, a former commissar under Bela Kun in Hungary, was arrested in Norway on his way to Russia with important documents for the Bolsheviks.

Germany.

Documents are said to have been found by the Lithuanian authorities establishing that the Independent Socialists were in touch with Moscow.

On 6 February the Tageblatt announced that the Freheit and Rote Fahne would be permitted to reappear on the 9th. The Independent Socialist, Hoffman, while condemning the Allies for demanding war

criminals, reproached the German Government for failure to itself prosecute such war criminals because of its fear of nationalistic opposition.

Austria.

Karl Toman, recognized leader of Austrian Communists, claims to be a Catholic, but is reported to be a Jew. He claims that the Communists, 20,000 active members and 100,000 sympathizers, are at present strong enough to overthrow the Government, but fearing the Entente would send in troops to crush such a revolution, are awaiting proletarian overthrow of the western nations.

Italy.

On 4 February the Catholics and the Socialists, during a debate on the steps to be taken by the Government in requisitioning oil, shouted insults at one another and engaged in a general free-for-all scrimmage, so that Mr. Orlando was forced to suspend the session.

Central Asia.

At the recent session of the Seventh All-Russian Congress of Soviets, Sultan Gali was elected a member of the Presidential Body as the representative of the nations of the East.

Constantinople is reported to be a center of transportation and communication for the Bolsheviks.

It is reported that there is much military activity on the part of Soviet Russia in Turkestan, where they are forming new units from natives and war prisoners and are establishing military bases presumably for an advance against India.

Bulgaria.

The Associated Press reports that Bulgarian Bolsheviks have fixed 1 May for a coup d'état against the present Bulgarian Government, as described by Bolshevist documents seized when 230 Communists were arrested at Sophia and 300 at Plevna.

CHINESE-JAPANESE RELATIONS.

Source: Reliable.

5 February, 1920.

The following translation of a report to the Japanese Government by Lieutenant-General M. Yui, in command of the Japanese force of occupation in the leased territory of Kiaochow, appeared in the Tsinan Jih Pao (Japanese) of 17, 18, and 19 November, 1919:

"I am not in a position to know whether now is the proper time to announce the settlement of Tsingtau nor what causes have led to such an announcement. Whether Tsingtau becomes a Japanese settlement or an international one the 20,000 Japanese residents will receive a blow, because the greater portion of these Japanese support

themselves by various kinds of business drawing customers from the 2,000 or more officials and soldiers. This means that the money coming from Japan will accrue to the profit of the Japanese. When the officials and soldiers are once withdrawn the majority of these Japanese will no longer be able to support themselves. Only those who have permanent interests in Tsingtau will be able to maintain themselves; this is absolutely certain. It is high time for Japan and the Japanese to see to it that the Sino-Japanese relations are improved in deed and not merely in word. Moreover, it is time for the Japanese to change their attitude toward China. The suspicions of China can not be allayed by merely saying that we have no territorial ambitions in China. Also as long as suspicion reigns, the anti-Japanese activities will continue. We should, therefore, convince the Chinese of our sincerity. If they look at Japan's former actions, the Chinese can not help suspecting us. Let me state briefly how we can convince them of our good intentions. Japan has declared to the British and the Americans that she merely intends to develop China economically, but such development can not be achieved until the fierce anti-Japanese boycott subsides and the Sino-Japanese relations are improved. We must attain the complete financial domination of the Far East, but if the Sino-Japanese relations do not improve, a third party will reap the benefit."

"It is said that as a result of the anti-Japanese movement Japan has sustained a loss of $100,000,000. It goes without saying that this is very painful to the Japanese, but the Chinese, who are responsible for the movement, also suffer heavily. A third party is reaping the benefits. This is why we should make up. Absence of territorial ambitions in China is a plain fact which we should make China understand thoroughly. In general, the Japanese incurring the hatred of the Chinese are those residing in China, where they regard themselves as the proud citizens of a victorious country. There also the majority of the Japanese who cooperate with the Chinese in business usually manage to have the profits accrue to themselves. The Chinese say the Japanese are sly, and that if they have once been business partners of the Japanese they dare not do it again. This is natural. Furthermore, Japanese travelers are on good terms with the Chinese while in China; but as soon as they return to Japan they critize and revile the Chinese. The press is largely responsible for promoting good feeling between China and Japan, but many of the Japanese papers publish criticism of China and incur the dislike of the Chinese."

"See how Japan treats the Chinese students who sufficiently admired Japan to come here to study. A place called Shen-Pao-Ting is set aside as a market exclusively for the Chinese. Is this not a remarkable thing? Nothing can result from mere talk about good relations.

The policy of the Government toward China is a thing of the past, but the attitude of the Japanese people toward China and the Chinese should be fundamentally changed. If true friendship between China and Japan is to depend entirely upon the Government, it will come to nothing; diplomatic officials, soldiers, merchants, and journalists should repent the past and make friends with China. There must be a complete change."

"In reporting any American events, the Japanese journalists are unduly deferential to the United States, but toward China they take a boastful attitude. In order to stir up anti-Japanese feeling, authors and newspapers kept accusing Japanese of this and that; at present the students are the source of this anti-Japanese movement. In the interior there is a fear that the United States may overrun China. According to my view there is real cause for such apprehension."

"Ostensibly, America is investing much capital in China and in Siberia, but as yet she has not done so. Chinese newspapers say that 42 loans are being negotiated with the Americans, but not one of them has been concluded."

"As I see it, the work done by the Americans in China is the establishment of missionary universities. In this they have achieved a great success. In the south and in the north there are altogether eight universities, which are centers of anti-Japanese activities."

"It was also reported that the United States would finance Siberia; but after a lapse of a year's time she has done nothing. At first it was reported that the Siberian Railroad would be controlled by the United States, but it has not materialized. Since the United States had difficulty in keeping troops in Siberia, only diplomatic officials will be left there. Before long all the remaining American soldiers will be withdrawn. There is a rumor that a secret agreement has been made, according to which Chinese troops will take the place of the American soldiers on the Siberian Railroad. At any rate, it is impossible for the United States to eliminate Japan."

"Great Britain and France have agreed to let Japan deliver $30,000,000 worth of arms and ammunition to the provincial government of Hupei, but the attitude of the United States is not known. As far as the Siberian railway is concerned difficulties will appear but no matter how clever the Americans may be, without money they can not accomplish anything. Formerly, when the joint investment of capital in railroads was advocated, Japan was willing, England and France seemed to be willing, but the United States refused. Thus the country which first announced the investment of capital withdrew."

"With reference to China the United States talks loudly about investing money in China, but fails to do so. This can be easily

proved by the annual lists, published in the newspapers, giving the comparative amounts invested in China by England, Japan, and the United States. In comparison with England and Japan the United States has no capital invested in China. How is it at all certain that the United States will invest capital in China to improve the transportation facilities? The Japanese often fear that the Americans will become interested in China's iron and coal mines. But if you reflect carefully; if they did mine coal in China, where would they sell their product? If they mine iron in China where will they take the ore to smelt it? Will she take both the ore and the stone to America to convert the iron into steel and ship it back to Japan? If so, the transportation charges would devour all profits. China is not an industrial country and does not need iron ore. In the Far East it is only Japan that needs iron ore. We are always listening with fear to the rumor that the Americans will mine Chinese iron ore. Why don't we do it ourselves? I know the character of the Japanese; and am not worrying about American affairs. If the Sino-Japanese relations are improved, as I suggested, it will be sufficient for Japan to extend her economic power in China."

"Now is the time for the people of China and of Japan to get together. The Government should decide on its attitude towards China and act accordingly, and the Japanese people should treat the Chinese courteously. With reference to the question of the Chinese students if the Minister of Education, the principals of the colleges and the police administration used suitable methods, the Chinese students in Japan would behave properly and study diligently. This would be a turning point in anti-Japanese boycott. Please mark what I say. Fortunately, the former order of prosecuting the boycott has somewhat abated. It is time to wake up and cause the anti-Japanese movement to subside entirely. If Japan persists in her former attitude towards China, the Shantung negotiations may afford an opportunity for renewing the boycott. In that case great sacrifices on the part of China and Japan will be unavoidable. If you boycott Japanese goods, Japan suffers loss, but China suffers loss also. This means that the whole Far East suffers. Let the Chinese reflect thoroughly upon this fact. Mutual discord between China and Japan will give the nations, not belonging to the Far East, an opportunity to increase their influence. Encroached upon by others and seeing their territory gradually conquered China and Japan will both perish."

"Therefore, our Japanese and the Chinese can not become cordial friends, unless we wake up. Such Sino-Japanese relations would be a great blessing to both the Chinese and the Japanese."

JAPAN'S REFUSAL TO JOIN THE CONSORTIUM.

Source: Reliable.

7 October, 1919.

The following are excerpts from an article by Mr. H. K. Tong on the above subject.

"Japan has politely told the United States that unless Manchuria and Mongolia, consisting of 1,730,000 square miles, or about one-fifth of the size of America, are placed outside its sphere, she can not join the new consortium for the financing of China. Great Britain and France tacitly and America openly oppose this stand she has taken. They have threatened to form a consortium without her, and this threat, if they really mean to carry it out, may secure a reconsideration of her attitude. Japan, after all, has no desire to be excluded from the powerful financial institution to be formed, although she would do everything within her power to try to secure a recognition of her special position in Manchuria and Mongolia."

"In the meantime, Japan is giving out the news that she is prepared to lend to China between $140,000,000 and $100,000,000 whereby she is hoping to find out whether or not the threat of the other Powers is a mere bluff. The Chinese authorities are being assured that whatever amount of funds they need will be forthcoming from the Island Empire. While the majority of the patriotic Chinese are decidedly against this alluring inducement, some of the northern militarists welcome it in order to relieve their financial stringency."

"In the last analysis, China will have to decide whether she wants assistance from Japan or from the other powers. If she can be quickly united, Japan's tempting offer will not be accepted but if not, there is a great probability for the acceptance of it by the North. For the time being, both parties are paying considerable attention to China's internal situation. Upon its future development depends the success of the one and the failure of the other. In the end, Japan will however have to join the consortium, whether she likes it or not, even if her wish to keep the development of Manchuria and Mongolia to herself is not acceded to, provided that the other three Powers do not show any dissension amongst themselves, and that they will modify their policy to meet China's views. These few lines briefly summarize the news concerning the differences over the new consortium's policy."

"Serious consequences will follow in the event of America, Great Britain and France yielding to Japan's claim to the exclusion of such a large portion of Chinese territory from the activities of the consortium. The least of all will be the resurrection of the sphere of influence day in Asia, the day which has passed together with the decision of the Paris peace conference that the balance of power

should be replaced by the League of Nations. It is a certainty that if Japan is allowed to treat Manchuria and Mongolia as her special areas, the other Powers will ask for similar privileges in other parts of China in order to counterbalance her influence. This rivalry for territorial spheres in China will lead to her partition as a nation."

"What is of more grave consequence following the Powers' recognition of Japan's claim to her special interests in Manchuria and Mongolia will be the part which this section of Chinese territory will play in the reported formation of *a Japanese-Russian and German alliance that will threaten the peace of the world.* As early as 1915, when the writer was in New York, Mr. Miller, the editor-in-chief of the New York Times, told him in the course of a conversation that this alliance would be inevitable after the war. One month ago, from an equally good authority, the writer learned that there was a connection between the alliance and Japan's Manchuria and Mongolian claim."

"On account of their geographical location, Manchuria and Mongolia are bound to form a link of this combination of the Japanese Government and the German leaders for some time. If there is a deflection of them, it will be dangerous to the whole plan. They happen to be a weak link, and it is the intention of Japan to strengthen it by every possible means. Hence her demand that Manchuria and Mongolia be excluded from the operation of the consortium, so that she herself can so develop them as to fit in with the general schemes, without the knowledge of the world."

"Some understandings are said to have been already reached between Japan and Germany. The first item on their program is to help Russia to stand on her feet. Russia's future allies must feel happy because Great Britain, acording to Mr. Lloyd George, has decided to leave Russia to work out her own salvation, and withdraw her troops. This British policy may influence America and France and result in their withdrawal of troops therefrom. That is what is desired by both Japan and Germany."

"To argue that such an alliance is impossible is to argue against the fact that Great Britain and France would not make secret treaties with Japan for giving away China's rights in the midst of the war, which they repeatedly declared was waged for the upholding of human rights. Why not such an alliance? Germany has been crushed physically, but not spiritually. Her sympathizers say that in the deplorable state she now is, she can easily defeat any single nation in Europe without much difficulty. Would she not dream of revenge? Certainly, and then there is no better ally than Japan to Germany. To Japan accordingly she is sending, so says the press

report, hundreds of experts for the manufacturing of the latest explosives, for the running of submarines, and for the making of other destructive instruments."

"Russia has even better reasons for such an alliance. She has lost the largest number of men in the war, and is now practically deserted by the Allies. The revolution and Bolshevism which are raging in Russian territory from one end to the other are the outcome of the war, but Russia is now left to their mercy. A number of Russians, who have recently come to China from Siberia, express their bitter feelings against the Allies in strong words. If there is a chance for her to get even with the Allies, she would do so."

"*Japan is trembling for her safety. The station of the American fleet in the Pacific Ocean is a concrete expression of America's ambition, and indicates a change of her foreign policy toward the Far East.* Japan foresees the possibility of an armed conflict with the United States, and her press does not hesitate to give to it all the publicity it is worth. She is naturally anxious to have allies. She has found Germany and Russia. Owing to the operation of the blue pencil wielded by the censors, the mind of the whole world has been allowed to slumber during the war. It will be a prodigious job to stab it broad awake soon enough to make its awakening effective in devising means to avoid the coming catastrophe by meting out justice wherever it is due."

"Such being the significance of Japan's claim to the exclusion of Manchuria and Mongolia from the sphere of the new consortium, she is putting up a smoke screen when she announces that she is basing her claim on geographical and historical grounds. It is, however, a very poor smoke screen. The geographical argument advanced by Japan in support of her Manchurian and Mongolian claim has no leg to stand on. Secretary of State Lansing, who made the Lansing-Ishii Agreement, refused to recognize the interpretation of 'territorial propinquity' as special or paramount interests for Japan. In other words, America has not recognized Japan's special position in South Manchuria. Furthermore, at the time when the agreement was concluded, China lodged a protest against it and declared that it was not binding."

"Knowing that the reasons given by Japan to support her claim are unsupportable and that they are a mere smoke screen to hide a big plan for aggrandizement, even her own people, who have caught the tendency of the world and believe in a new international principle of joint security and equal opportunity, are opposing the proposal to exclude Manchuria and Mongolia from the Consortium's activities."

BOLSHEVIK PROPAGANDA.

Source: Reliable.

7 January 1920.

(11316)

On 18th December, 1919, a Bolshevik courier en route from Moscow to New York was captured by the Lettish authorities in Riga. He was traveling under the name of Pederov, but his real name is Kovalov. He was carrying dispatches to a certain Jakson of the Russian newspaper Nowyj Mir in New York City. He had been sent from Moscow by the Committee of the Third International. He also had 60 diamonds in his heels. He crossed through the lines on the 9th of October, but was unable to get out of Riga. The papers were concealed in a false partition of a box which he was carrying. The following were addresses mentioned in various parts of the documents:

Emil Cohen, 466 W. 149th St., presumably New York City.
Dr. H. Robins, 379 Verien St., Jersey City, N. J.
Mrs. G. Woskoff, 1942 Douglass Street, Brooklyn, New York.
Mrs. Marrias, 48 Stuyvesant Street, New York City.
Mrs. Sweet, Sand Brook, New Jersey.

TRANSLATION.

Dear Comrades, I beg to inform you about our present work in America.

(1) We believe that after the exclusion of several national sections from the A. S. P. the time has come to form a communistic party in America that might officially join the Communistic International. We think on the other hand that this party might be formed of: (*a*) The exsocialistic propaganda league—radical (and now excluded) elements of the A. S. P.; (*b*) the radical (left) elements of S. L. P. (a part of which as we are informed behaves badly) must be split; (*c*) J. W. W. whose nonpartisan principles vanished with the acknowledgment of the dictatorship of the proletariat and the Soviet power. When the formation of the communistic party has been accomplished it will be necessary to appoint a corresponding representative at Moscow.

(2) We are convinced that the principal task will consist in forming communistic organizations amongst the soldiers and sailors (organizations of military parties) which would energetically spread propaganda in favor of the soldiers' and sailors' soviets, and a furious persecution of officers and generals.

(3) One must prevent the organizations of laborers' soviets (council of laborer deputies) from turning into philanthropic cultivated institutions. We fear very much that this is a great danger for America. That is why we particularly consider that the soviet, before gaining the power, must be a fighting organization to struggle for the power of rule and the dictatorship of the laborers. We would not retreat a step from our task. Secondly, the splitting of the proletariat into national groups must be prevented. For this reason it will be necessary at first to form a soviet of laborers of different nationalities, based on the development of the movement. Nevertheless the leading power of the revolution will be Americans.

(4) The principal war cries are: (*a*) Down with the Senate and Congress, and long live the rule of the laborers? Long live the laborers' soviet! (*b*) Down with the capitalists and managers of factories! Long live the administration of the factories by the laborers! All organizations of supply are to be in the hands of laborers, etc. Everywhere the idea of turning all economic organizations and administrations over to the working class should be sharply emphasized, as well as propaganda and agitation along these lines (against extravagance, the syndicates, and trusts). The common principle of socialization of industry is not to be confused with the nationalization of capital during the Soviet régime. The opinion is to be spread that Wilson is a hypocrite and a robber. You know all about the intervention, but we beg you to pay attention to the moment of economic strangulation here and in Hungaria, and also to the handman's rôle of the "great democracies."

(5) Pay great attention to the American Federation of Labor, which must be crushed; work in close touch with the J. W. W. to organize a professional revolutionary movement.

(6) The idea of armed laborers must be spread in every way and revolutionary soldiers (demobilized) prevented from giving up their arms. This is in accordance with the principles of an International Soviet Republic. Frighten people with the idea of new wars, which are being prepared by the capitalists. Fight with every means against organizations of white guards. To do this the most radical methods should be used.

(7) Act in close cooperation with one another and do not let yourselves be split into groups. Organize conspiring "revolutionary staffs."

With communistic greetings.

Bureau J. C. Communistic International.

JAPANESE ACTIVITIES.

Source: Reliable.

22 December 1919.

(11844)

El Semanario Bonaerense, a small Japanese weekly paper published in the Argentine, will shortly be subsidized by the Japanese Legation in Buenos Aires, according to the editor of the paper, and a larger weekly paper written in Japanese and Spanish, will be issued weekly to the South American public. The paper is distributed only on a very small scale at the present time, but the editor states that he will increase the size of the paper and publish a Spanish section as soon as he receives funds from the Japanese Legation. These funds, he states, have been promised and will be given in January, 1920 (next month).

MISCELLANEOUS.

THE QUESTION OF WHETHER BATTLESHIPS ARE OBSOLETE OR NOT—VIEWS OF SIR PERCY SCOTT, ETC.

Source: Reliable.

3 February 1920.

The following quotation is Sir Percy Scott's most recent contribution to the subject as to whether battleships are obsolete or not and appeared in London Times, 12 December, 1919.

" There must be great changes in the future Navy. In my opinion, its most important arm of offense and defense, the aeroplane, has been taken from it; we are going back to the customs of 100 years ago, when we had our ships worked by sailors, but the guns manned by artillerymen from the shore. Now we shall have our aeroplane-carrying ships worked by sailors, but the planes they carry will be fought by members of the Royal Air Service; a scheme which I do not think will ever work satisfactorily. If the surface battleship is dead, then its death will greatly affect the future Navy. I said before the war that she was dead; I and a great many naval officers now think that she is more dead, if that is possible."

" Mr. Walter Long tells us that there are two sides to the question: The one says that aircraft will destroy the big battleships by dropping bombs on them; the other that they will not be able to do this, as they will be counter-attacked; but there is a third side to the question—aircraft will destroy the battleships by torpedoes."

"There is an arm that could have been, and ought to have been, developed during the war, but the Admiralty had no appreciation of the value of it and it was not perfected until the war was over." r

"The introduction of dropping mobile torpedoes from aeroplanes have made the existence of the battleship still more precarious. If we or the Germans had at the battle of Jutland 40 aeroplanes carrying torpedoes one of the two fleets would never have reached home; the low visibility which obtained during that battle would have been all in favor of the aeroplanes; they could have come quite low down and made sure of their targets; they would, of course, have been accompanied by fast fighting machines to ward off counter attacks."

"Mr. Walter Long only mentioned bombs. The use of mobile torpedoes introduces a question which will require very careful consideration before we even think of building another surface battleship."

BATTLESHIP BUILDING.

Sir Percy Scott and Our Future Navy.

The following article appeared in Naval and Military Record of 10 December, 1919:

"Speaking in London at a reception on behalf of the Waifs and Strays Society, Adml. Sir Percy Scott expressed the opinion that we should not build any more battleships. At present a battleship of 30,000 tons carried about 100,000 lbs. of high explosives, had a gun range of 15 miles, and cost about 7,000,000 pounds. This colossal battleship could be sunk by one aeroplane. On the other hand, an aeroplane costs very little money and travels at a speed up to 150 miles an hour. If there were a sufficient number of them 100,000 lbs. of high explosives could be carried and dropped on the enemy's country or on his ships. When a battleship returns to refit at the base it proceeds slowly; an aeroplane returns to its base at 100 miles an hour and takes little time to recharge. The aeroplane is going to be a very important factor in the Navy of the Future. The submarine and the aeroplane have revolutionized naval warfare. What the Admiralty were going to build he did not know."

It may not be out of place to briefly review the whole subject. Before the war Sir Percy Scott wrote a letter to the Times in which he pictured the submarine as rendering battleships useless, reading this over carefully in the light of subsequent developments it appears that Sir Percy Scott did not have in mind the submarine campaign against commerce which actually developed, but rather the possibility of submarines taking capital ships with great success. Whereas many are willing to give great weight to the opinions of

Sir Percy Scott's views because of his prophecy; service opinion does not strongly indorse it because when the matter is carefully studied results show the submarine was not as efficient as expected in attacking warships. However, those who answered Sir Percy Scott at the time often made themselves ridiculous by the particular arguments employed. Admiral Bacon for instance said that navigational difficulties would prevent the submarine from amounting to anything. One other admiral said that a machine gun would suffice to put a submarine out of commission.

At the end of the war Sir Percy Scott again came to the front with various letters in which he argued that aircraft would drive battleships from the sea. He wrote from time to time upon these lines. Lord Fisher made vague statements to the same effect. This was before the Admiralty estimates. In the Admiralty estimates Mr. Long answered the critics in advance by saying that they had not been at all backward in pushing the development of naval aircraft. They had seaplane carriers and torpedo planes developed as much as any other service. He said that some would argue that it was unwise to build any more capital ships, but that they should practically take up the project of having an "air navy." A certain amount of caution, however, prevented them from discarding the present types at this stage and until developments showed the wisdom of that course. Aviation was a fine idea to work with in the hopes that it would drive navies off the sea, but the present development of the aviation material did not warrent scrapping surface vessels at this time.

In the debates on the naval estimate, this matter was argued back and forth. Mr. Long, who is not very technical and was probably speaking only in a popular way, was unfortunate enough to refer to the attack by aircraft as little more than a bomb-dropping operation. In the letter to the Times Sir Percy Scott straightened him out in this respect. Sir Percy Scott appears to be quite correct in saying that if bomb dropping were all that the surface ships had to fear there would be nothing very revolutionary possible. He makes clear perhaps for the first time that among the really technical advocates of aviation navies there is nothing much expected from aircraft bombs on airships. When they talk of aircraft driving surface vessels off of the seas they understand by means of the torpedo plane.

British service papers supported Mr. Long in his contention that the time was not yet ripe to do away with surface craft. It was also agreed that the torpedo plane and not bomb dropping is the future of this kind of aviation work.

Naval and Military Record 4 February, 1920, contained an article entitled "Is the big ship doomed?" which follows in full:

"Is the Big Ship Doomed?"

"In the highly improbable event of a new challenge to our naval supremacy occurring in the near future formidable enough to compel us to augment the Navy as rapidly as possible, valuable time would probably be wasted in discussing the expediency or otherwise of building capital ships."

"As is well known, there are many distinguished naval officers who regard the big surface ships as quite obsolete. Lord Fisher and Admiral Sir Percy Scott are both quite positive on this point. On the other hand, officers of more recent war experience, such as Admirals Jellicoe and Beatty, dissent from this extreme view. The former has drawn up a programme of naval defense for the Dominions which involves the construction of battleships and battle cruisers, while the First Lord was unquestionably speaking of Admiral Beatty when he intimated in December last that the Board of Admiralty was not prepared to accept the view that the day of the capital ship was over. The fact that these two great sea officers, whose tenure of command of the Grand Fleet covered the entire war period, still trust to the dreadnought to uphold our command of the sea is very significant. In an informative article which he contributes to the new "Fortnightly" Mr. Archibald Hurd attempts to answer the question "Is the Battleship Doomed?" The conclusion he reaches is that the *Hood*, a composite vessel which embodies the qualities of battleship and battle cruiser in a single hull, indicates the line on which naval designers, obedient to the deliberate opinion of the younger war-experienced naval officers of to-day will continue to work."

"Scrutinizing the Evidence."

"Mr. Hurd subjects to a close examination the arguments of those who think the capital ship is dead. As he points out, both submarines and aircraft, which we are told will dominate the seas in future, signally failed to disturb the balance of naval power in the late war, though both had golden opportunities which probably never will recur. Experience showed, first, that the submarine was dangerous mainly because it was novel; and, secondly, that aerial attack on any ship steaming at a fair speed and zigzagging was ineffective. It is true that both the submarine and the aircraft may become more formidable, but it is also true that steady progress is being made in devising means of resisting their attack. One may circumvent the torpedo by improving the subdivision, by moving at high speed on a zigzag course, by throwing out a screen of destroyers, and by more scientific means of which the Navy knows a great deal more than the public. Notwithstanding the spectacular U-boat exploits of the war, and the phenomenal development of

submarine navigation since 1914, it is a fact that the Navy to-day has far less dread of submarines than it had three or four years ago. As for aircraft, their future offensive possibilities can only be conjectured since there is little data to go upon. Much depends on whether bomb or torpedo-dropping can be brought to a reasonable degree of accuracy, which has certainly not been achieved up to the present. The one weapon against which no effectual protection has been devised is the big gun, and since the big gun can only be taken to sea in batteries of six or more by the big capital ship, it seems a foregone conclusion that this type of fighting vessel will endure, malgre the submarine and flying enthusiasts."

"Misunderstood Strategy."

"One explanation of the readiness with which statements as to the doom of the dreadnought and other sensational forecasts are accepted by the public is its failure to comprehend the strategy of the late war at sea. The Grand Fleet being out of sight, was more or less out of mind, yet that fleet exerted an influence on the course of the war incalculably greater than the joint efforts of all the submarines, aircraft, and other mosquito auxiliaries. "The Naval War," says Mr. Hurd, "was won by the gunned, armored, and swift surface vessels of the British fleet, whether battleships, battle cruisers, or light cruisers; and everything else, destroyers, submarines, and aircraft, were extension of the power which resided in those large ships." This, of course, was well understood by the enemy. For the first 12 months, at least, his U-boats were constantly attempting to attack the Grand Fleet but always without success. The immunity of that fleet from loss by submarine attack during more than four years of war furnishes convincing proof of the submarine's limitations. The torpedo plane is another weapon on which we are told to stake our naval future, but before doing anything of the sort we would be wise to demand proofs of its power. No such proofs were forthcoming during the war. The Germans made extensive use of torpedo planes in the North SeSa, but their total "bag" amounted, we believe, to a couple of unarmed merchantmen. The modern warship, speedy, well armed with antiaircraft guns, and escorted, perhaps, by a cloud of fighting planes, would be no easy target for aerial torpedo craft. Finally, we have the example of United States and Japan, both of which are building squadrons of great capital ships, larger, more heavily armed, and more expensive than the *Hood*. Both countries are singularly receptive of new ideas, especially in regard to naval technique, and it is incredible that they would be spending such enormous sums on capital ships unless they had convinced themselves by experience, observation, and deduction that no reliable substitute has come into existence."

"Value of Publicity."

"It is important that all the facts about the big ship controversy should be well ventilated. If the antidreadnought partisans are allowed a free field for their propaganda, and if their wildest claims pass unchallenged, public opinion will eventually become saturated with these heresies of sea power, and will be more than ever disinclined to vote money for the new dreadnought which may be needed some years hence. France had to pay heavily for her blind faith in the doctrines of the so-called Jeune Ecole, which taught that sea power could be purchased for trivial outlay on diminutive torpedo craft and fast commerce raiders. For years she concentrated on this "naval dust" and omitted to build battleships, with the result that her fleet grew weaker and weaker and has eventually been outclassed by the mushroom German Navy. The prestige rightly attaching to the names of Fisher and Scott should not blind us to the fact that neither has proved infallible as a prophet. Their arguments as to the obsolescence of the big ships are admittedly based upon theory alone, since neither served afloat in the war. With all deference to these distinguished officers—we yield to none in appreciation of the value of their services to the Navy—we are disposed to attribute greater weight to the views of such war-experienced authorities as Admirals Jellicoe and Beatty when it comes to deciding the ship types of which our future Navy is to be composed. The capital ship may be on the eve of radical modifications in design, but few who have impartially examined the data furnished by the war will be bold enough to maintain that its period of utility is over."

REPORTED ACTIVITIES OF SEMIONOFF IN SIBERIA.

30 January, 1920.

The following report is published not because its authenticity is vouched for but because it gives a graphic picture of conditions as they probably existed around Semionoff and as affecting the future of Siberia.

The report as received concerning the activities of Semionoff in Siberia under date of 30 January, 1920, follows:

While European Russia has suffered, first through experience of the revolution and later at the hands of the Bolsheviks—becoming weak and exhausted—Siberia is still full of life and is putting forth great efforts to reconstitute the State, to drive the Bolsheviks from Russia, and finally, Siberia is still very rich and her wealth will be of inestimable value in the rehabilitation of the finances, commerce, and industry of reconstituted Russia.

But Siberia is, so to speak, divided into two different parts, i. e., western Siberia, which comprises the territory between Cheliabinsk

and Irkutsk, and eastern Siberia, the center of which is the Transbaikal district, which has already played a great rôle in the past and is destined to play a still more important rôle in the future.

Public opinion in Siberia, like its territory, is also divided and follows two main channels. Some hold that the salvation of Russia lies in the friendship of the Allies, and argue that it is necessary to show the Allies (America, France, England, etc.) that the people and the country as a whole are not responsible for the said happenings of the last few years; that the past should be forgotten, etc.

On the other hand, the adherents of the other party believe that the eastern sections of the country should be separate and without any dependence on the Allies whatever. They hold that Japan should be the first friend of Russia, and these, as we shall see further on, have entirely different plans from those who adhere to the Allies.

There are opinions, but these are of secondary importance.

Some for example affirm that there will soon be an entente between Russia, Japan, and Germany. But this plan has no importance and will never be popular among the masses.

I. Transbaikal District.

Many people in eastern as well as western Siberia and European Russia place great hope and reliance in General (Ataman) Gregory Semionoff. They speak of his fierce struggle against the Bolsheviks from the time when the latter occupied the whole of Russia and Siberia, and are ready to make a national hero out of him. (The truth of the matter is that Semionoff's agents are fostering this idea.) Although frequent news and rumors reach Chita which are highly compromising to this "hero," these rumors seem to be so improbable and horrible that the people readily attribute them to envy and say that they are spread by his enemies, etc. Finally it is most difficult to believe what is taking place in the Transbaikal District unless one sees it with one's own eyes.

Indeed the "work" of General Semionoff is very dangerous for the Russian people and might lead the nation into a sad plight. The reasons for this we shall state later. There are many.

The fault can not be placed upon him entirely and for everything. He is surrounded by people who have no thought but for themselves and for whom the fate of Russia is a matter of utter indifference.

These people are grouped into different categories. Some of them hold the general completely at their mercy because they know too much about his intimate affairs. They are in the possession of such compromising secrets that if they revealed them they would ruin the reputation of their chief forever. Among these, for instance,

are General Ofanasieff, Colonels Jourkowsky, Stiepanoff, Wlassievski, and others. All of these men are without a heart or conscience, detested by everybody, but, nevertheless, holding important positions under Semionoff.

After the above come those (and they are in great number) who have been with Semionoff for a long time, but joined him not out of any particular motive, but because of the good positions easily obtained, good salaries, the opportunity of becoming a colonel or even a general, and secure plenty of money without being particular as to the means, the chance to lead a gay and free life; this is what attracted them. Their number is very large.

There are also those who only think of stealing money. They are called " thieves " aloud. Such are, for instance, the General Intendent (Quartermaster) Birinkoff, his assistant, Captain Fedotieff (the latter's daughter spent 200,000 roubles in Japan last month), Colonel " Prince " Tambouir, Malinovski, etc. It is an established fact that generals who, at the most, receive an official salary of two or three thousand roubles per month, spend at restaurants for dinner with liquors and champagne as high as from twelve to twenty thousand roubles, and this is a frequent occurrence.

There are, it is true, officers who are brave and conscientious, without a kopek in their pockets, but these, alas, are in very small numbers. These unfortunates suffer much; they are often dismissed or shot for telling the truth. They are even beaten. We shall write a special chapter on these unfortunate victims.

But this is not all.

Semionoff has a lawful wife, and a beautiful child, but he abandoned them about three years ago and is now living with another woman, a chorus girl from the " Palermo " at Harbin by the name of Maria Michailovna, or simply " Mariette," a Bohemian, although a Jewess convert to the orthodox faith.

Nothing could injure Semionoff's reputation any worse than this woman of abominable reputation. However, she plays an important political rôle. She arrests and imprisons both officers and citizens who she meets in the streets.

She is always surrounded by persons whose reputation is frightful (Gordon, Issakaroff, etc.). This, notwithstanding, she plays an official rôle even in Japan where, six months ago, she made speeches at banquets given in her honor by Japanese merchants. It was after one of the dinners, when a little drunk and in tears, that she related to me the story of some of the massacres that remained hidden and unexplained till then, such as the massacres of Mrs. General Nazvaloff, Colonels Stepanoff and Volfovitch, as well as other repulsive stories connected with Semionoff's past life.

The chapter devoted to this woman, who calls herself the "Present Day Josephine," will be one of the longest and most important as well as the most sad.

Like certain of his generals, this woman holds Semionoff at her mercy (we know the contents of certain telegrams sent by him to her in Japan). She also holds in the palm of her hands some of the special agents, aides and other officers who received their appointments through her, some of them being her ex-lovers.

It is impossible to describe in a few words all that took place in Transbaikalia. The entire lack of any law and order, the prisons full of innocent victims, the executions, the terrible places of Dauria, Macievskaya, and other stations.

Much time is also required to analyze the opinion of the inhabitants of Transbaikalia, the Cossacks, the peasants, and the "Intelligentia." As to the Cossack soldiers their morale is not always the best. In the month of July last the first Regiment of Semionoff's Cavalry had no sooner reached the front to fight the Bolsheviks when the men killed eleven of their officers and deserted to the enemy. Occurrences like these are the cause of Semionoff's efforts to obtain troops from elsewhere, i. e., Mongolia.

II. Foreign Policy.

If the internal policy and conduct of Semionoff and his entourage in Siberia are dangerous, his foreign policy is still more dangerous.

The scandal which took place between Admiral Kolchak and Semionoff made a great deal of noise in Russia. And although it now seems to everybody that Semionoff and Kolchak are working in perfect accord, this is a mistake; Semionoff is not sincere in so far as he is concerned; *he has his own policy*, *his plan*, which does not jibe with that of Kolchak and of Russia as a whole.

This plan, we must admit, is most exceptional, although fantastic, and, we repeat, very dangerous. It consists in the bringing together of territory in the East in such a manner as to form a compact block within a line running as follows: Through Mongolia, Chinese Turkestan, Russian Turkestan, Persia, etc., as far as Arabia. The people of these countries are to be brought together and organized so as to become a preponderant power and rule the destinies of the whole East independent of the League of Nations and European countries in general.

Mongolia is marked out for the principal rôle in this adventure. Aside from this, Semionoff has considerable interests in Mongolia. He has succeeded in making himself very popular among the Mongolians, whose country, language, manners, and customs he knows to perfection. He has been proclaimed Grand Inke (Svietleichy Cniaz) of Mongolia. In the first place, he supports the Mongolians

against China; secondly, he persuades them to remain loyal to him; and thirdly, he is beginning to occupy Mongolia with his troops—an expedition consisting of two regiments and artillery went to Urga a month ago—finally, in the fourth place, he tries to prevent the Chinese from interfering and obstructing his work in Mongolia. The means he employs to reach the desired end will be later described in detail.

I have forgotten to state that, according to his plans, Mongolia is to supply him with soldiers, as he has only a little more than 15,000 men, and these, as we have already seen, are not always properly disposed.

He also relies on the Buriats. A general meeting of the Buriats of Transbaikalia and Mongolia is to take place at Chita in the month of November to decide the question whether they shall join the Cossacks of Transbaikalia, whose chief is Semionoff, or whether they are to organize a new corps of Cossacks—the "Buriat Kossaks" under command of Semionoff.

The importance of Semionoff's relations with Japan is enormous. It is the Japanese who furnish him arms and money, and it was the Japanese who supported him in the rivalry between himself and Kolchak. Now a portion of the Japanese people is against him, the Japanese Government is hesitating, it seems, and is not giving any more money. The numerous Russians in Japan say that the embassy and the Military Mission are against Semionoff.

Semionoff decided to carry on an active propaganda in Japan, and it was I he sent there to organize it. Details thereon will be given further on.

There has now come to Japan a certain Mr. Gortinski, a newspaper man who formerly wrote for the socialist papers and who has now become a monarchist.

Aside from the matter of propaganda Gortinski has a special mission; he must find documents compromising the Russian Military Agent in Japan, General Podtiaguin and the members of the embassy. He has succeeded in finding and copying some documents which show that General Podtiaguin has been in communication with the Bolsheviks.

There will soon arrive in Japan a special mission of Semionoff which is to remain there permanently. Kassievski, Semionoff's friend, was in Tokyo about three weeks ago and spoke to the Japanese General Staff regarding the matter and the Japanese gave their consent.

On the other hand there already exists between Semionoff and the Japanese a certain understanding regarding economic questions.

The story of what has already been accomplished in this direction can not be related in a few words. I will state here that Semionoff

and the Japanese are trying to appropriate to themselves the whole economic life, all the industry and all the commerce of eastern Siberia. General Nikonoff has spent a few months in Japan and has half settled the matter. A commission composed of nine Japanese and two Russians, together with General Nikonoff, left for Russia (Vladivostok and Chita) 22 October, 1919, the day before I sailed.

The chapter on Japan will be of considerable interest and includes important details.

Mention will be made of:

1. Semionoff's relation with the Jews of Chita.
2. Semionoff's past life.
3. Czechs, Kalmikoff, etc.
4. Of my conversation with the so-called wife of Semionoff.
5. The plan for a propaganda campaign in Japan, Mongolia, Persia, and Arabia.

1. MATERIAL RESOURCES OF SEMIONOFF.

Before taking up Semionoff's relations with foreign countries, such as Japan, Mongolia, and others, it is necessary to say a few words regarding the state of Semionoff's finances.

Before the existence of the Omsk Government and when the Bolsheviks had not as yet been driven out of Siberia, especially along the Trans-Siberian Railway, Semionoff's resources were derived from three different sources: (*a*) Foreign aid; (*b*) Requisition of state property; (*c*) requisitions levied on private individuals.

(*a*) We already know that for a long time Semionoff held out or camped not far from Manchuria Station, which served, so to speak, as a base for his army, consisting at first of only a few men, which was later rapidly increased by officers, pupils from the military schools, cadets, students, Russians, Buriats, Mongolians, Chinese, and Cossacks who joined his band. This entire band had to be fed, clothed, and well paid. The pay of Semionoff's troops is very high, the lowest grade of private soldier receiving no less than 75 roubles per month aside from all kinds of other compensations, and the noncommissioned officers received a great deal more. As to the officers, especially those of his entourage (and they are many), they were paid in certain cases large sums of money. At Harbin, where these warriors went to rest, champagne flowed in rivers, and the restaurant bills that did not exceed two or three thousand roubles were considered as trifling.

General Horvat (now an enemy of Semionoff) had promised to furnish a considerable amount of money. Thousands upon thousands of roubles were continuously required. (In these days the

Russian money was worth a great deal more than to-day. Horvat, first fooled Semionoff several times, and finally sent him by Kolchak, who was then with Horvat, a very small sum. In one word, Semionoff could not count on Horvat's government, and was forced to look elsewhere for the large sums of money needed to fight the Bolsheviks. It was about this time that he entered into closer relations with the Japanese. He soon succeeded in securing aid from Japan, consisting of monthly sums of money and war materials as well. It is certain that he was given this help under certain conditions, as the Japanese soon sent a military attaché to him, or simply, a surveillant, who is always with him as his Japanese adjutant. Now, and for more than one year, these functions are being performed by Captain Sevo, of the Japanese General Staff.

NOTE.—During the last trip of Maria Michailovna to Japan in September, 1919, this captain traveled with her as her cashier, interpreter, and go-between in her dealings with the Japanese authorities. They arrived in Tokyo on 13 September and left for Russia on the 8th or 9th of October.

As soon as the Bolsheviks had been driven out of Chita and from along the railroad line in the Transbaikal District and Semionoff had moved his headquarters at Chita, there came a Japanese military mission, having at its head Colonel Kurosawa, of the Japanese General Staff, and his aid, Major Jugami, of the Japanese cavalry, and they are still there.

Well, it was the Japanese, who, on one side, gave Semionoff money, and up to a certain date, of which we shall speak later, the amount of money given by the Japanese in yen to Semionoff was considerable and exceeded some millions of roubles.

As to the Chinese, we lack details. But what is certain is that Semionoff received a certain sum from them on the pretext of defending the numerous wealthy Chinese merchants in the small towns of Manchuria from the Bolsheviks.

(*b*) As soon as Semionoff occupied Chita, after driving out the Bolsheviks, he appropriated the resources of the State. He took 1,000,000 roubles from the State Bank; he seized large amounts of money from every establishment he could. Briefly, for some time all the money which in normal circumstances belongs to the State, to the Government, was passing into Semionoff's hands. Being then independent of Kolchak and later in direct conflict with him, Semionoff felt himself the supreme ruler of his small kingdom of Transbaikalia. The idea he can not take out of his head even now, and he will perhaps never give it up, and he profited by his position. If we consider that at this time the Japanese were still furnishing him aid, we will note that Semionoff had then several fine sources from which to obtain enough money not only to pay his soldiers

but also to spend millions of roubles on his pretty chorus girl, the Jewess Rosenfeld, baptized and named Maria Michailovna. One of her overcoats is trimmed with fine furs which cost (the collar and sleeves only) 250,000 roubles.

NOTE.—During her previous trip to Japan in March, 1919, the Japanese papers spoke of her fineries and mentioned the famous overcoat. One of her diamond necklaces, which we had the occasion to admire, cost 700,000 rubles, another one of fine pearls and a large green stone 280,000 rubles. Aside from these there were rings, bracelets, and different less expensive necklaces. We heard her say that the value of her diamonds exceeds 2,000,000 rubles and that she had several millions of rubles in cash which she had promised Semionoff to share with his lawful wife in case of his death (she told me this between 3 and 5 o'clock, 16 September, 1919, in the room 58 of the Seyoken Hotel at Tokyo). In fact there was sufficient money at that time.

(*c*) But he still had another source. We must here state that speculation in Siberia has reached enormous proportions. There are all kinds of contrabandists (most of the train conductors figure among these) who for these last four years travel between Irkutsk and Harbin continuously. Now, at the frontier, at Manchuria Station, and later at Chita, Vierkni-Udinsk and other large stations, Semionoff's soldiers hold up the passengers and take from them considerable sums of gold, etc. These operations have also produced as much as a million rubles, and the victims of these requisitions are often beaten, shot, and even hung.

Nevertheless Semionoff often found himself in straitened circumstances. He told us that he had had most disagreeable moments, when he had no money and it was absolutely necessary to pay the soldiers and officers. The Cossack soldiers were becoming uncontrollable. What was to be done? He was, on one occasion, at his wit's end when the representative of the Jews, who are very numerous in Chita, called on him and brought him a considerable sum of money. A second time when he was out of money he invited them to contribute himself, and the Jews gave him only thirty or forty thousand rubles.

When the Omsk Government was organized, things took a sudden change, especially when Admiral Kolchak became dictator, Kolchak's famous order No. 61, wherein he calls Semionoff a "traitor" changed his position. Kolchak had no relations with Semionoff. Kolchak, the hope of Russia, finds that Semionoff is a mere adventurer, on a large scale it is true, but nevertheless a traitor and a bandit. This was too much. Public opinion began to turn against Semionoff. The State bank could no longer be touched. The Japanese began to hesitate.

A new personage then appeared on the scene; this was Mr. Kogeouroff, editor of the Rusky Vostok (The Russian East), created by Semionoff and supported by him (20,000 roubles per month). He

obtained a great influence over Semionoff, and persuaded him to pay no attention to Kolchak and to keep at his work.

Semionoff then undertook a trip eastward in his special train together with Kogeouroff, and visited Kalmikoff and the Ussuri Cossacks, but this did not help the situation.

Meanwhile the Transbaikal Cossacks became discontented; there was no money, and the situation finally became difficult. A "Krong" or a parliament of Cossack representative of all the Cossack villages of Transbaikalia was called at Chita. In the month of May the "Krong" opened its sessions. But each day Semionoff's position became more and more difficult.

About this time there arrived at Chita, on his way to Omsk, General Ivanoff-Rinoff, commonly called the "great trickster." It was he who acted as intermediary between Semionoff and Kolchak; and upon the latter's arrival at Omsk Semionoff sent a telegram to Kolchak. Kolchak pardoned him, the "Krong" was satisfied, and in the beginning of June, 1919, Semionoff was elected "Ataman" of the Transbaikal Cossacks (up to this time he was not their Ataman, although he was Ataman of all the Cossacks of Western Siberia.)

Semionoff is not sincere. As we have seen, his plans are different, but his troops had not been paid for three months. The Japanese already hesitated. Circumstances were such that it was impossible to levy requisitions. The people were beginning to become dissatisfied and wise to everything. The soldiers of the First Regiment had killed 11 officers.

Kolchak not only pardoned Semionoff, but immediately sent him 26 million roubles (it is with funds of this money that Maria Michailovna came to Japan) and promised to make him, not only major general, but lieutenant general—a great title in Russia. Semionoff, who is only 29 years old, is now a lieutenant general.

This notwithstanding, Semionoff has no money. We must not forget that the Japanese yen is worth from 50 to 60 roubles and has been as high as 100. The sum of 26,000,000 roubles is not very large under these conditions, especially considering that Semionoff's soldiers and officers had not been paid for three months.

Finally, Semionoff is now without money, but he hopes to have some by the beginning of next spring.

Gortinski, Semionoff's agent in Tokyo, has just told me that all the officers are heavily in debt, that the generals are paid by the contractors of Semionoff's quartermaster, that this money is not now sufficient and that it is absolutely necessary to find a way of regaining the sympathies of the Japanese.

These are the few facts which must be remembered before speaking of Semionoff's relations with Japan and other oriental countries.

2. THE PLAN OF GENERAL GREGORY SEMIONOFF.

We have stated in Chapter 1 that Semionoff was not sincere in sending the telegram of apology during the session of the Cossack "Krong."

NOTE.—All the Cossacks in Russia have for a long time enjoyed the privilege of controlling their interior or local administration. The "Krong" is, so to say, a Cossack parliament which meets ordinarily once a year in the most centrally located city of the Cossack territory—for the Transbaikal Cossacks—Chita is the city where this parliament meets.

He has his own plan, or rather, his own idea. This idea although dangerous both for Russia and the peace of the world as a whole, although fantastic, we must admit, for even a Napoleon could not carry it out, is nevertheless most original and provides a chance for General Semionoff to prolong his existence as leader in case he should some day be forced to leave Siberia, or Russia. As he himself admits, he is an adventurer on a large caliber, he has the power to charm and influence whomever he speaks to, and exercises great influence over semisavage people, and he will not submit to elimination as easily as may be desired.

In what does this superb idea of Semionoff consist?

Undoubtedly he has enough common sense to understand that a fight against great nations such as America, England, or France is impossible, not only for him but also for Russia, even in case of complete regeneration. Is he impelled by hatred against these countries? I doubt it. This plan is merely the outcome of his adventurous spirit—nothing more or less. Well, what must be done? If everything happens as it should, he will only occupy a secondary position or rôle in the development of future events. More powerful personages, men better qualified, more honest, will play the rôle which he considers as belonging to himself alone. Maria Michailovna, at a banquet (luncheon) given her by the representative of the Japanese merchants who had come in contact with Semionoff, Mr. Mori, at the Shiba Park Restaurant in Tokyo, in the presence of several Japanese, the parish priest of the Orthodox Cathedral, Mr. Mii, the exgovernor of Odessa, Mr. Tolmatchoff, and in my presence, raised her glass full of champagne and said, "Let it be as it may, I am convinced that it will be neither Kolchak, nor Denikin, nor anyone else, but Ataman Semionoff himself who will be the first to enter Moscow! We now have as dictator Kolchak, who is the instrument of America and England, but the day will come when another man will occupy that post, who will be installed in that position by our true friends, the brave Japanese. You know that this man can be no other than Ataman Semionoff." (These words are translated from my notebook where they were entered three hours after the luncheon.) If

we do not forget that these words were pronounced semiofficially on 16 September 1919, if we bear in mind the hatred of Semionoff toward Kolchak, if we read the semiofficial organ "Russky Vostok" (now published under the name of "Vostokniy Kurier") subsidized by Semionoff and edited by Kogeouroff, assisted by his agent, Gortinski, during the months of February, March, April, and the first part of May, 1919, where may be found many articles against Kolchak and his government; and finally, if we remember that in Chita, among the officers there exist two factions, those who are against Kolchak and the Omsk Government (these by far the most numerous), and those who favor a peaceful arrangement between the two leaders (in very small number) and that Semionoff naturally looks more favorably upon the members of the first faction than upon those of the second group—we will thoroughly realize that he is not sincere in his relations with Kolchak—furthermore, he makes no secret of it. Everybody who is at all familiar with conditions in Transbaikalia knows it perfectly well.

NOTE.—Editor Kogeouroff was brought before the courts for one of these articles which appeared in the number for the 18th of June, 1919, but as an understanding was arrived at between Kolchak and Semionoff he was saved from a prison sentence by dropping the case.

Semionoff's plan is such that he can do without Kolchak—furthermore, he makes no secret of that. He can do without Russia, without the Russian people. And for this reason, we repeat, this plan is altogether original.

He thoroughly understands the real condition of these oriental people, who are, however, semisavage. And he conceived the idea of bringing all these people together and organizing them into a league of oriental peoples. According to his plan, this must begin with Mongolia, then Turkestan, Persia, Afghanistan, and as far as Arabia. Briefly, his plan is to bring together all those people within that region who have no separate government or are not separate states; not completely, but semi-independent.

I must here state that this plan is guarded with the utmost secrecy. A few days before my departure from Japan in speaking with General Nikonoff (who was then on business for Semionoff) I let him understand that I knew of this plan. He showed great surprise and looking at the door, he said to me in a confidential tone "Shut up! don't ever speak about that; only a few generals know about that, and it is too soon to speak about it." However, it was Semionoff himself who told me of this plan when he visited my home a few days before the date set for departure, not for Japan, but for Mongolia, where I was to go on business regarding which I shall speak further on.

For several months (in this year) there lived in Chita a person who was only known to a few, an officer, the Arab Prince Al Kadiri. It must be admitted, however, that the few having dealings with this individual had very little confidence in him. This Arab Prince was to return to Arabia at an early date. Semionoff kept him (he lived at Semionoff's hotel) and trained him for propaganda work among the Arabs. It was I whom Semionoff charged with conferring with this Prince (because I was the only person in Chita who had been in the Near East and Arabia and who knew the Arabic language and French well enough (the Prince speaks Russian, but not very well), and explain to him for the time—he had been given instructions every day for several months—how he was to act. Two or three of Semionoff's officers were to leave with him. But, unfortunately, I was not able to receive this Prince at my home, as I left a few days afterwards for Japan. All I know is that the Prince Al Kadiri left Chita soon afterwards to return to his native country. On his way home he was to spend some time in Persia, where Semionoff's agents have been for some time. He also was to stop at other places; briefly, he was to carry on propaganda en route. (It is said that the Prince is well known in the Near East and has acquaintances nearly everywhere.)

We must add further that Semionoff places great reliance on the Kurds. That his idea was conceived long ago, is proved by the fact that he is educating a young Kurd by the name of Alexis, 16 years old (a rogue of the first water) whom he is training in a hurry for the purpose of sending him as soon as possible, as an interpreter and propagandist, with his agents, into the countries to the south of the Caucasus. It was I who was charged with the work of giving lessons to this worthless individual, which I did for two months. I was freed from this abominable work on my departure. The boy (he calls Semionoff "papa") was given by his "papa" two crosses of Saint George. He did not speak, read, or write Russian well, but he knew perfectly well how to spend his time in the cabarets and houses of ill-fame with the officers of Semionoff's detachment. This unfortunate being has also acted as a spy for the so-called Madame Semionoff. By visiting all the public places in the city he hears what is being said and reports it to her with augmentations and embellishments of his own. He is liked by his "mama" as well as by his "papa." I tried in vain to open Semionoff's eyes about this boy, but he always said that he was exactly what he needed: "He is a talented propagandist and he has the knack of seeing everything, and furthermore he will not be sent out alone." He is now spending a few months in the Corps of Cadets at Habarovsk.

From the above we see that the work of Semionoff in the countries at a distance from Chita and eastern Siberia began when I was still at Chita (I left there 21 July, 1919). I have heard since that this work is now much advanced, but I do not know of what this advance consists of. When I was there it was only the beginning.

The most important at that time was (1) to do everything possible in Mongolia; (2) in China; (3) in Japan.

Mongolia is certainly the most important field for Semionoff at present. It is the corner stone of his oriental scheme.

But it would be a very great mistake to think that Mongolia is of importance to Semionoff alone from the point of view of his scheme. To succeed in this fantastic scheme much time is required, as he well knows. He has for the present more serious and important business in Mongolia. Naturally, if he succeeds in this business his chances for the future will be increased, but for the present this Mongolia is his field. Perhaps Japan also—but "Mongolia," he says, "is the safest."

From the historical point of view Semionoff's scheme seems at times childish, even ridiculous, like a foolish game. But we must never forget the price of these childish games—blood, the loss of thousands of lives—and if not checkmated in time it will bring misfortune upon misfortune to the already sorely tried and unhappy Russian people. Still Semionoff continues to play his game, as the trend of events show but too well.

Ataman, General Semionoff was born in a Cossack village in the Transbaikal district. This district is near Mongolia. The Russians, and especially the Cossacks of Transbaikalia, have had trade relations with the Mongolians for a long time; they go into that country to buy horses, oxen, cows, and meat in general. On their side, the Mongolians continually visit the towns and villages of the Transbaikalia to purchase manufactured goods, tea, sugar, etc. Thus for many decades the closest relations have existed between the Transbaikal district and Mongolia. It must also be stated that the population of Transbaikalia consists largely of Buriats, a Mongolian people whose customs and religion are the same as those of the Mongolians proper. Many Cossack men and women of Transbaikalia are married to Buriats.

Note.—There are hardly any peasants in Transbaikalia. All the villages are inhabited by Cossacks.

These are intermediaries. They help the two people to understand each other. It is for this reason that Semionoff, having been born among the Cossacks, is thoroughly familiar with the customs, religion, and beliefs of the Mongolians. (This, as we shall see presently, is very important.) He has had many friends and acquaintances

among the Mongolians from childhood. He has also traveled very much. Briefly, he has all the qualifications required to carry out his plans in Mongolia.

What are these plans?

We will not here repeat the rôle Mongolia is to play in his general scheme. But it must be remembered that if he succeeds in his purpose, he may always, if forced to it, leave Russia and find there, not only a refuge, but also a base for his future operations, such as he had in China and Mongolia in 1918, when he was compelled (because General Horvat refused to help him) to retire to Manchuria Station during his struggle with the Bolsheviks. He is doing everything in his power to become master of Mongolia. In the beginning of this year he succeeded in getting the Mongolians to appoint him "Grand Duke of Mongolia" and his aide-de-camp, Colonel Malinovski who accompanied him on his visit to Mongolia, received the title of "Prince Tambouir Malinovski."

NOTE.—Colonel Malinovski is now Semionoff's representative at Harbin. Everybody, even Maria Michailovna, calls him "thief" aloud. He keeps the most expensive women in Harbin. He once paid 12,000 roubles for a dinner in the Cafe Chantant in Vladivostok. His lawful wife lives in Hailar. His only son, 12 years old, is a derelict on the streets of Japan, and it was I who asked Captain Sevo of the Japanese Army mentioned in Chapter 1, to give him 100 yen. I then had him admitted to St. Joseph's College at Yokohama, and gave him my nephew's room at the house of General Tolmachoff.

Semionoff has few soldiers. I am not speaking of those soldiers who are under his orders by virtue of his office of assistant to the commander of all the armies of western Siberia, General Rozanoff: I speak of those who belong to his own detachment (Osobiy Otriad). These number about 15,000 men. This was the number before my departure for Tokyo; and it is possible that the number is now greater, but can not exceed 16,000 or 17,000 men, or 18,000 at the maximum. They are all Cossacks, except a few from the "Intelligentia" class. The troops that he formerly had when fighting the Bolsheviks have all been discharged. In April, 1919, all men who had completed the classes of preliminary education were called into the service; some few thousand trained men joined the Army at Chita, and Semionoff sent them immediately to Makkavejevo—to Colonel Joukovski, mentioned in the first part of this statement.

The total of 17,000 or 18,000 men is not very great, but the value of this force is further reduced by the fact that the morale of these troops is not at all satisfactory. It is true that the officers are loyal to Semionoff, but the soldiers, as in every place in Russia, are spoilt—one will never know what they will do when put to the test. Aside from the Bolshevik propaganda among them, there are other causes that make it impossible to rely on them. For example: In

the beginning of July, when the Bolsheviks suddenly appeared in large numbers at Nertchinsk, at a time when there was hardly any Japanese troops, Semionoff sent to the front the first and second squadrons of his best guard regiment, or the best Cossack regiment of Transbaikalia. What happened? As soon as they reached the front they murdered their 11 officers and passed over to the Bolsheviks. When it was learned that the Second Regiment was to be sent out the soldiers said to the inhabitants: "As soon as we reach the front we will do as our comrades of the First Regiment."

It was the Bishop of Chita who sent for me on an urgent summons to come to him and informed me of the boast of the soldiers of the Second Regiment as to what they would do the next day, and asked me to warn Semionoff immediately. The ataman was not at home, so I reported the matter to the chief of staff.

Therefore it is impossible for Semionoff to rely on these soldiers, not to mention the "Intelligentia," who joined the ranks under the order of the month of April, and who are nearly all Socialists (Russian Socialists) and enemies of Semionoff.

He must, therefore, have a contingent of reliable troops, brave and well disciplined. Such are the Mongolians, especially if they join voluntarily.

As to the Buriats, to which reference has just been made, notwithstanding the fact that they have always been loyal to Russia, they continue to be more Mongolian than Russian. They are almost savages and unorganized. It is a fact that a fairly large number of their children studied in Russia and worked as laborers and employees in the colleges, but, nevertheless, the race as a whole remains attached to its Mongolian traditions and pagan customs. The Buriats also served in the Russian armies, but only in the Cossack units. Semionoff has started the organization of a special Mongolian Buriat regiment, composed entirely of Buriats and Mongolians, and has also persuaded the Buriats to group themselves into organizations of one sort or another. Among the Buriats themselves there is a difference of opinion. Some hold that it would be best to join the Cossacks of Transbaikalia, whose chief is Semionoff; others prefer to organize a new Cossack Corps of Buriats. During this month (November) there is to be held in Chita a conference of the representatives of all the Buriat settlements to definitely settle this question. But, in any case, it is Semionoff who is to become their chief, as we must not forget that he is still general in chief (Pohodiy Ataman) of all the Cossacks of eastern Siberia, i. e., not only of the Transbaikal Cossacks but also of the Ussuri Cossacks, whose chief is Kalmykoff, and of the Amur Cossacks, whose chief is Camoff.

Semionoff is beginning to penetrate into the heart of Mongolia. He began the occupation of Mongolia in October, 1919, by sending

two regiments and artillery to Urga under the semiofficial pretext that there were 40,000 men dodging military service; that by occupying that city he will be in a position to make them do their duty. But even if it were true that this city harbored that many deserters, these are merely a pretext, and once there he does not intend to withdraw. Urga, as we know, is a very important center in Mongolia, and the great Mongolian highway going from Peking into the eastern countries we have spoken of in the preceding chapter. Aside from this, Semionoff has numerous agents scattered throughout Mongolia, the majority of whom are Mongolians, who have been at work for a long time and without interruption.

In order to thoroughly succeed in Mongolia Semionoff must: (1) Obtain the good will of the Mongolians who are not yet in his favor. There are several of the Mongolian princes (Hochuns) among the most intelligent, who are opposed to these adventures; (2) fan and rekindle, so to say, the hatred of China among the Mongolians, as well as their fear of China and their longing for liberty (this is what Semionoff is doing above everything else and, as we have seen, with great success); (3) see that China, which is naturally worried by Semionoff's conduct among the Mongolians, does not interfere too much with his business in Mongolia.

Well, how does he act?

The means he makes use of to obtain the greatest influence over the Mongolians are as strange as they are well adapted to the customs and beliefs of the people.

We know that the Mongolians, though a pagan people, are very religious. Their priests (lamas) are all monks. There are also many convents in Mongolia, and the convents are frequently not only centers of the moral and intellectual life of the country, but also the centers of its political life. The pontifex maximum of the Buriats and Mongolians—the Dalay Lama, is not alone a religious chief; his powers and influence over the Mongolians are immense. So is the influence of the entire clergy, of each lama in Mongolia. And it is precisely among these that Semionoff gains the greatest support and friendship. He has visited the Dalay Lama, to pay his respects personally, more than once. Once, at the beginning of his campaign, he went to ask him for money, horses, etc. Later, when he (Semionoff) was in plenty, he frequently sent him expensive presents. Briefly, the Dalay Lama is very much in his favor, and the most intimate relations have never been interrupted between the two headquarters—that of the pagan archpriest and the would-be savior of orthodox Russia.

His relations with the numerous lamas of Mongolia are also very close and friendly. It is through them that he acts on the people of Mongolia, and it is also among these that he selects most of his

special agents. He would like to see all the lamas become his de facto agents.

All the above, as well as the story that follows, was told to me by Semionoff in person, as I was to go to Mongolia as his attaché to the Dalay Lama, which was most natural, as I am a priest and the relations between the orthodox mission of Transbaikalia and the Lama's church had been for some 10 years most friendly.

But let us return to our story. According to the beliefs of the Mongolians, God comes on earth from time to time—in Mongolia. When he comes on earth he lives in a man. But, nevertheless, this man carrying God within him is not always a god. When he so desires he removes his divinity, so to say, and ceases to be God for any length of time he desires, and then again becomes God when he wishes it. Otherwise stated, during the life of this man God comes and goes from him from time to time.

For a long time there has been no God in Mongolia (he comes to earth not oftener than once every hundred years). And it must be remarked that when he shows himself all the people run to him, for it is an event of extreme importance for the Mongolians.

Now, several months ago, the "God" so long expected finally made his appearance. He was an old man with long white hair and beard, dressed in a strange costume. He had a son, a young man of from 25 to 30 years of age, who acts as his father's secretary. The people, when this "God" appeared, ran to him from all parts of Mongolia (he ordinarily stays at a small hamlet—not always at the same place—he changes often). The influence of this "God" is enormous and is growing every day, as he speaks of only current political events.

This "God" is man-made, and it is Semionoff who created him.

While explaining his Mongolian business, he said to me, suddenly: "Besides I have my 'God'".

I was stupefield. Then he related to me the foregoing story and also told me that the "God" when he ceases to be "God" lives with him, in full comfort, but carefully watched, and when it is necessary he again becomes "God" and goes to Mongolia to say what he has to say. Semionoff places great reliance on this "God" and rightly so, because the increasing influence of this "God" surpasses all imagination. I have seen, with my own eyes, people kiss his legs, the hem of his clothes. He is given money * * * and when his duty is done he peacefully retires to the house.

As a matter of fact, it is not very difficult to keep alive the hatred of the Mongolians against China, with which country they have been in disagreement for a long time. He, therefore, may succeed in having them appoint him to whatever position he desires, as well

as secure their permission to bring his troops into their country. Finally, it is not improbable that they will allow themselves to be cajoled into joining him in his adventures. Semionoff works there without respite as he looks upon Mongolia as his "main straw" in the accomplishment of the desired end. Finally, it is easier to get a hold on Mongolia than on any other country.

But the most difficult thing is to arrange matters with China. It is true that the Chinese have several times favored Semionoff, especially when he was fighting the Bolsheviks, last year.

Semionoff is now courting the favors of the Chinese.

At the luncheons in Japan, mentioned above, Maria Michailovna, addressing the Japanese said: "Now everybody is beginning to understand who this brave General Semionoff is. My husband is now in China and the Chinese offer him everything; they say they will give him money, arms and also soldiers if he wants them because they know his worth. He is invited to Mukden and other cities and is given ovations and pompous receptions everywhere. But my husband says to himself: 'Now that I have such good friends in the Japanese I will accept nothing from others.'"

This last sentence is far from the truth. On the same day when I was taking this lady back to the Seyoken Hotel in an automobile, she showed me a telegram from her "husband" who was awaiting her, as follows:

"When are you coming back? Business here very good. I am sending you money. Come back as soon as possible—Guicha." (Guicha is the Russian pet name for Gregory.)

The telegram was dated at Mukden. Upon my inquiry as to the meaning of the telegram, Madame told me that it referred to business in China. I must add that it is very probable that Semionoff was there raising money, because his woman first said that she had no money, having spent all he had given her, and that she did not know whether he could send her more, as he was then very short of money himself. But after the receipt of this telegram she did not remove to the Japanese village where she had intended to spend two weeks, but remained with all her suite (three women and two men, whose expenses she paid, in addition to the large sums of spending money she supplied them) at the Seyoken Hotel for more than two weeks, occupying five rooms de luxe, enjoying themselves in unthinkable nightly orgies. She ordered fancy dresses and shoes from the best and most expensive milliners and shoemakers of Yokohama, as well as other purchases in the most expensive stores, and the hire by the day of the best automobiles available. All this must have cost a large sum of money, for the rooms at the Seyoken cost 14 yen each per day, or 70 yen daily for the five. If we consider that at that time 1 yen cost

from 60 to 80 roubles, it is apparent that her total expenditures during her last days in Japan amounted to several million roubles.

NOTE.—One of the dresses she purchased at Yokohama cost 850 yen; a shawl, 400 yen. These were paid for in my presence.

Now, previous to these lavish expenditures, we know that she was short of money, and that her "husband" had none also. Consequently, there is no doubt whatever that he found money in China. He is said to have had dealings with Chinese merchants, and these probably gave him the money, for it is very doubtful that the Peking Government would furnish him any money.

According to information received two days after Madame Semionoff had left Japan, from General Nikonoff (of whom we shall speak later) and from Semionoff's best friend, his personnel officer, Lieutenant Colonel Wlassiwski, Semionoff's business in China and Mongolia is progressing very satisfactorily and in the coming spring he "will do something" that will change the situation in Russia, and which will raise him still higher. There is no doubt that Semionoff is preparing something for the spring, some bold, new enterprise, because when he sent Mr. Gortinski to Japan, in speaking to him for the last time before his departure, he repeatedly told him: "I can not place any money at your disposal at present, but get along the best you can until spring. By that time we will have plenty of money, and everything will be different. Meanwhile, work, work without respite."

Returning to the subject of Mongolia, we must add further that this country, aside from supplying men and arms, can also supply horses and forage in large quantities and food for the men; that the country is rich and an excellent base for Semionoff from which to carry out his enterprises.

III. Japan.

We have already stated that Semionoff's relations with the Japanese Government date back to the time when he was fighting the Bolsheviks, when they still occupied the whole of Siberia, and when he still was near the Chinese frontier. Captain Sevo (Sebo?) of the Japanese General Staff, mentioned above, was one of the first Japanese officers attached to Semionoff. When Semionoff took Chita and moved his headquarters to that city, the Japanese Government sent to Chita a military mission headed by Colonel Kurosawa (a graduate of the General Staff College) and Major Yugami, cavalry, as his assistant. This Japanese military mission is quartered on the main street (Bolchaia Ulitsa) in the house of the wealthiest merchant of Chita, Mr. Polontoff, which they rent, together with its luxurious furniture.

There is also at Chita a Japanese consul general by the name of Furasawa, who, like Colonel Kurasawa, speaks Russian perfectly, and who lives in a beautiful house, also luxuriously furnished, on Sofiyskaya Street.

Finally, when the Japanese troops came to Siberia the headquarters of the Third Japanese Infantry Division was established at Chita. The most important personage of these headquarters, as far as we are concerned, is the chief of the Intelligence Department, Captain Matsumura, who is also a graduate of the Japanese General Staff College, speaking only Japanese and a little German, having as his assistant Captain Itaya of the Japanese Infantry. This Department, together with a detachment of soldiers, the Japanese Military Bank, the headquarters of the Third Division, and the office of Division Commander Ooba, occupied the enormous house of Vteroff, the largest and most beautiful in Chita, facing on four streets with main entrances on Korotkavskaya and Alexandrovskay, two of the most important streets in Chita. The Third Division has now returned to Japan and its place has been taken by the Fifth Division. This change took place in October. But Matsumura is still (at least up to 23 October 1919) at Chita, and it was stated that he would be there for some time and would possibly be attached to the Fifth Division in the same capacity.

We must also mention the official interpreters (they wear the uniform of officers and perform important functions) of the department just mentioned. These consist of (1) the translator of the Japanese Military Mission at Chita, Mr. Matao Tanabo, who not only acts as translator for the Mission but is entrusted by the Japanese Government with a number of important functions. He often appears as the representative of Colonel Kurosawa (it can be seen that they place great confidence in him), and has relations with all sorts of individuals, establishments and newspaper officials. Briefly, he is an important functionary of the Japanese Government in Chita, and an aid or adjutant of Colonel Kurosawa rather than a translator. He speaks Russian well, and is much more intelligent and clever than the others. (2) The translator and interpreter for Captain Matsumura, Mr. S. M. Suzuki, Japanese orthodox convert, who has completed the course of the Seminary of the Orthodox Mission at Tokyo. He speaks Russian very well. (3) The translator or interpreter of Captain Matsumura, Mr. Okamoto, speaking Russian also. The three men play a definite rôle in the events we speak of. There is still a number of other translators in Chita, but these are employed in making written translations exclusively. All these translators and interpreters have remained in Chita, as the Japanese are complaining of the scarcity of translators, notwithstanding the fact that they

have mobilized every man available, and the majority of these understand and speak Russian, very badly. Even the three best above men turn out translations which are completely unintelligible; a jumble of verbs, substantives, and other parts of speech, without any common sense.

We will now say a few words about the persons here named.

Colonel Kurosawa is the personage having the greatest importance for Semionoff. It is through the Japanese Military Mission at Chita that the majority of his business with the Japanese is conducted. It is through Kurosawa, or rather from Kurosawa's own hand, that both Semionoff and his employees and agents receive their money. Semionoff and Kurosawa are therefore personal friends.

We will now make a brief mention of the money received through Kurosawa. We have already spoken of the low rate of exchange of the Russian money, which rate has fallen so low within the last few months that for a few days a short time ago 100 roubles were required to buy a Japanese yen—that is to say, the rouble was worth 1 sen in Japanese money! For this reason, when Semionoff had to send an officer or some other person to Japan, or when a Russian serving under Semionoff went there of his own accord, there was always great embarrassment, because even large sums of Russian money were ridiculously small when converted into Japanese money. The steamer ticket from Vladivostok to Tsuruga alone cost several thousand roubles. In this case Colonel Kurosawa and the Japanese Military Mission came to the rescue if they found that the trip was necessary or useful. Then Mr. Kurosawa furnished the money in special military paper currency. The Japanese Government issued for the special use of its troops in Russia a kind of military paper currency. This consists of 5-yen notes, whereon is written in Japanese and Russian: "Imperial Japanese Government, 5 yen." A dragon is printed in the center of the note which is rose-colored and of stiff paper of the kind used for hotel or business cards. Well, the money, not in very large sums, was furnished in these notes, which could be exchanged at the Military Bank above mentioned, either at the Vtoroff Building or at Harbin, at the "Specie Bank" or other Japanese banks.

As to the money given Semionoff himself it was always (at least up to now) in notes of the Bank of Korea (Chosen bank). It is also in these notes that the officers and employees of Semionoff in Japan receive their salaries. Semionoff's representative General of Artillary Nikonoff, who spent the months of August, September, and October in Japan, was allowed for his expenses a very large sum—some 10,000 yen—and had in his possession notes of 100 and 500 yen of the bank of Chosen exclusively. (Naturally, this money was furnished by Kurosawa, because Nikonoff brought it with him from

Russia.) Lieutenant Colonel Wlassievski when he came to Japan for a few days, also had Chosen bank money exclusively, which he exchanged in Japan. When I was offered payment for my work of editing Japanese translations in Chita (which I refused to accept) it was in Chosen bank notes that they offered to pay me. In general, aside from these proofs, it is an established fact that all the money paid, loaned, or given outright to Semionoff was in Chosen bank notes. Japanese themselves do not use these bank notes except in Transbaikalia and Manchuria.

But let us return to our subject. The Japanese Military Mission at Chita is the high agency through which Semionoff and his headquarters deal with the Japanese Government. It is also this mission which has charge (and bears all the expenses) of the Japanese propaganda among the Russian population. In the month of April, 1919, I was called to the residence of Colonel Kurosawa. After having made a long speech on the subject of Russo-Japanese friendship and the sympathetic feelings of all the Japanese for the Russian people, and after having confided to me that the enemies of law and order, and consequently the enemies of Russo-Japanese friendship, were stirring up the population of Transbaikalia, he explained to me the necessity of organizing not only a counterpropaganda, but also a more active propaganda in favor of the friendship of Japan and the Japanese. He spoke to me thus because I was the editor of the paper Rusky Vostok and a collaborator in several other newspapers and periodicals in Siberia, and a lecturer (I have been delivering many lectures not only in Chita but in the provinces also; this being my principal occupation) and finally, because I, as a clergyman, who preached three times a week in the cathedral of Chita, possessing a great influence over the population and attracted many people, including many who had no relation and others who were not of the Orthodox faith. I must add that about this time several orthodox processions parade about the streets of Chita and that it is customary to preach five or six times in different places of the city while the procession is passing through the principal streets. Well, according to Colonel Kurosawa, every possible means was to be employed for the purpose of this propaganda. He also said that propagandists should be sent into the provinces; that the military mission would bear all the expenses, no matter how great these might be. I gave him no reply because I had been in Chita only two months and was not familiar with conditions and did not know Japan or the Japanese. I had nothing further to do with this question up to my departure and I ignore what has been done since.

Semionoff leaves Chita very frequently to visit Vladivostok, Harbin, the Ussuri Cossocks, Mongolia, or to inspect the places

where his troops are stationed (he has his own private train which is always preceded and followed by two armored trains); but when he is in the city Colonel Kurosawa visits him every day. And Semionoff frequently visits the Japanese Mission. In May or June, when there was a feast some place across the Mongolian frontier, they both went there in response to an invitation. Kurosawa, or his representative in case of his absence, also attends all the reviews and celebrations of Semionoff, his maneuvers, etc. Up to the present both worked in harmony and there is no doubt that the relations between Semionoff and the Japanese Military Mission at Chita have been the most cordial. If Semionoff wants to send a letter or despatch to Japan, or any of his agents in Japan want to write to Semionoff, the letters are forwarded through the Japanese Mission, and his letters are transmitted by them to Chita, or Japan, as the case may be. Thus these letters do not go by ordinary mail, but by special military post which has its own car in the mail trains running daily between Vladivostok and Chita, and thus avoid the risk of being disturbed by Japanese censorship, and are absolutely safe from the Russian censorship at Vladivostok, where all the correspondence is opened and delayed. They are also safe from the indiscretion of the postal official at Chita as well as persons of Semionoff's entourage at his headquarters. The Japanese Military Mission delivers the letters directly into the hands of Semionoff. It is through this channel that the most secret correspondence between Semionoff and the Japanese Government is transmitted, except the letters that Semionoff sends direct to Japan by his special agents.

The functions of Captain Matsumura are also very important. He is a brilliant and most clever officer, still young, very attractive and intelligent. His intelligence is superior to that of any other, including the Japanese generals I have known, and I have seen many. Briefly, he is more like a European than an Oriental, although he only speaks his native language and a little German. It would seem that his business in connection with the intelligence department of the Third Division should be limited to military matters or matters connected with the Bolsheviks or Bolshevism. At least this is what I thought when in the month of April, I was invited by Captain Matsumura and detailed by Semionoff to act as editor of the news from the front given out by the Japanese to the Russian press. But on entering the office I was greatly surprised. It must be explained that, as I was very busy with other important work, and could not go to Captain Matsumura's office they sent the translations made by the Japanese translators to my home for me to edit. Nevertheless, I went to Captain Matsumura's office almost every day, and he also often visited my office, and I knew perfectly well what was going on.

Well, you may imagine several large rooms having in each one long table and several small ones. The long table begins at the door and occupies the whole length of the room, near the window. The large table is surrounded by soldiers and noncommissioned officers, sitting on stools and copying what is given to them by the officers and the interpreters who occupy the small tables. They work thus from 8 in the morning till 12 noon, and from noon to 1 o'clock they have lunch, and again work from 1 p. m. until 6 p. m. It is very difficult to get into these offices; two sentinels at order arms stand at the street entrance, and there are about 10 more upstairs who do not allow you to pass unless you have a pass—a square piece of wood with Japanese writing on it.

The first thing you notice upon entering one of these rooms is a pile of different newspapers and periodicals; not only all the newspapers of Siberia, but also papers in other languages from Manchuria and China. Each article, every line written about Japan or the Japanese, or which may be of interest to the Japanese Government, is forthwith translated and copied. The most important papers are translated in their entirety. This is done immediately upon receipt of the papers to keep the press information up to date. We must do them justice for the thorough organization of this work, although it involves a large amount of labor. For example, the Chita newspapers, as soon as received, are cut up in pieces and distributed among about 10 or more officers, translators, and noncommissioned officers who know the language, and in about one hour everything is translated and copies are sent in to Matsumura or to Ooba, and to all those who may have need for the information. If there is anything important, an interesting article, etc., a translation thereof is immediately sent to Japan.

The second part of the literary work consists of the following: There are also received various Japanese papers and articles in manuscript, mostly written by Japanese officers, and often inspired. These are translated into Russian, and are edited by the Russian editor, when there is one, and then published in the Russian papers—especially in those favorable to Seminoff and the Japanese. Useless to say that these articles are of the propaganda type and to show how much the Japanese are doing for the Russians, and consequently, hinting to these latter how they should act on such and such a question.

But, undoubtedly, the most important part of the work of Capt. Matsumura is the collection, by all means available, of information which is of interest to the Japanese Government. His agents, especially the three called Tanabe, Suzukim and Okamoto, enter into friendly relations with the officers, newspaper men, editorial staff,

ordinary private citizens, employees, etc., for the purpose of securing news and information of different subjects. What Mr. Matsumura is most interested in is public opinion. During the months of April to July, he was very anxious to know the opinion of the different classes regarding Semionoff, Kolchak, and Horvat, and what the public thought of their reconciliation after Semionoff's telegram to Kolchak. Also whether there were many Jews in Chita and Irkutsk; what was their attitude toward Semionoff; what was the attitude of the different classes of the Russian people toward the Japanese, etc. All of these questions and many others of like nature absorbed the thoughts of Matsumura and his agents, and they sought information regarding them from every possible source. They naturally took an interest in current events. It must also be remarked that while their relations with Semionoff were of the most friendly, these Japanese collected from every source all the information they could secure against him. They appeared to put no great faith in him, and evidently knew he had his price, although they needed and made use of him. At times a certain hesitation on their part was noticeable; something had evidently changed in the relations between Semionoff and the Japanese Government, and all information obtainable was needed to clear up the question, and as guidance for the future.

As a matter of fact, Semionoff's position in Japan was not as rosy as he and his agents would have the Russian people believe.

In general, Japanese public opinion of the Siberian question is divided into two camps. Some argued through the press that the Japanese troops must be withdrawn from Siberia. They say that enough blood has been shed; that the whole world is tired of war, and finally that conditions are unstable even in their own country.

On the other hand, the other camp says that the Japanese have too many interests in Siberia to remain indifferent to what is happening there; that the troops now in Siberia should not only be retained, but their number increased.

It is very difficult now to predict which of the two parties will eventually win out, because this question has only been seriously agitated within these last days and was provoked by strikes and other events. Furthermore, Semionoff and those Japanese who favor him are doing everything they can to turn public opinion to their side.

It can not be said that the Japanese Government is indifferent to the political opinions on this subject. Are these not the cause of that Government's evident hesitation?

But Kolchak was in power when the Japanese still blindly believed in Semionoff, when there existed no friendship between these two leaders to provoke Japanese displeasure, and when perhaps

they did not know Semionoff well enough (his moral qualities and those of his entourage); and, finally, when they hoped to profit by his friendship at little cost to themselves, they did not hesitate a moment to assist him in everything he desired. They gave him money and other proofs of their friendship most willingly. But now that they have seen and realized that the advantages to be obtained by helping Semionoff are doubtful, and that his help requires greater sacrifices than they had figured on, that if the Government furnished help on a large scale it would create interior discontent and friction, and, finally, that after so many months and the loss of so many Japanese lives nothing has been gained and the general situation is no better than it was months before, and that the expected benefits become more and more problematic—the Government begins to hesitate, and, in any case, is in no hurry to evince its friendship for Semionoff in a substantial manner. And Semionoff and his "high officials" who come from time to time to Japan do not feel so confident and strong as formerly; at times they look rather confused.

It is for these reasons that Semionoff decided to spare no efforts to regain the good will of the Japanese Government, as well as that of the Japanese social circles having most influence. He therefore decided to organize in Japan his own propaganda compaign.

This is what he intends to do: He sent to Japan a certain Mr. Gortinski, a newspaperman of doubtful reputation, not any too honest, but rather clever. He arrived in Tokyo 18 September, 1919. The orders he received were as follows:

1. To establish relations with the newspapers and periodicals of Japan and with representative newspaper publishers, and to endeavor to have articles favorable to Semionoff appear in the different papers as soon as possible.

2. There is in Japan a monthly publication printed in Russian and Japanese, called "Golos Japanii" (Voice of Japan). In the Russian as well as in the Japanese section of this periodical there frequently appear articles contributed by ministers and members of the Japanese Parliament. The character of this paper is unique; it often contains articles which are contradictory to other articles in the same number, every shade of opinion is accepted by the editor whose purpose is to make as much money as possible out of the advertisements.

This paper has at times published articles which were very disagreeable to Semionoff.

Gortinski was to enter into relations with the editor and owner of this journal, Mr. Ueda, and his secretary, Mr. Kaneda, and join the editorial staff for the purpose of changing the paper's policy

in Semionoff's favor and also to make use of it for propaganda purposes.

3. He was to establish relations with officers of the Japanese General Staff and keep on friendly terms with them.

4. To start a newspaper or a weekly periodical in Japan in the Russian language. This paper was intended for circulation among the numerous Russians now in Japan, 99 per cent of whom are bitter enemies of Semionoff. The paper was also to be sent to Siberia and also distributed among the Japanese, a large number of whom know Russian sufficiently well to read it.

5. Gortinski was to be subject to my orders for everything that I required of him and was to do nothing without my consent; briefly, he was under me.

6. He was to deliver frequent lectures in Japanese (through an interpreter) and in Russian.

7. Finally, he was to write articles on Semionoff for the Japanese vernacular papers and have translated and printed in Japan a pamphlet printed in Russian dealing with Semionoff's rôle in the anti-Bolshevik struggle.

But, alas, Gortinski was not given a single yen to cover the expenses for this work, other than 30 yen in Japanese money and 7,500 roubles in Russian money (about 150 yen) to pay his traveling expenses. They promised to send him small sums for his living expenses, but warned him that this would not be sufficient to live on in Japan and that he was to earn his own living; that at the beginning of next spring he would be well rewarded. Meanwhile he was to prepare and organize everything, as there would be plenty of money and Semionoff would be able to do everything on a large scale. Gortinski consented, because he was a soldier and also correspondent of several Russian papers, such as the Rostokniy Kurier, the Courier of the Orient at Chita, Soviet and Viestnik Manchuria at Harbin, and Dlanievostoknio Obozrenie at Vladivostok, which pay him at the rate of 20 sen Japanese money per line. Besides this, he expected to make money out of his articles for the Japanese press and from lectures.

At this time I was in Japan also for the purpose of founding a paper, but only for circulation in Russia. In Russia one can not write all one desires, especially in Transbaikalia, where I last lived—it would be too dangerous. I was not familiar with conditions in Japan, although I knew that the Japanese, notwithstanding their hesitation in giving material aid to Semionoff, would not expel me from their Empire. I believe a periodical like the one I intended to found would be very useful to Russia. I had already engaged an editor; but when Gortinski arrived (this was during the time that Maria Michailovna was in Tokyo) I already knew everything and

was thoroughly disgusted with being in Semionoff's service, and I had already resolved to quit it, though I had not as yet sent in my resignation.

Now, when Gortinski arrived I did not hinder him in any way and only watched what he was doing.

As soon as he arrived he went to the Japanese General Staff and presented himself to the Chief of Staff, who told him to address himself to Captain Kouvasi(?) of the General Staff and to Major Hasimo (Hasimoto?) whenever he had any business to transact. Both speak Russian well and the first, Kouvasi, evidently performs important functions.

It is to these two officers that Gortinski proposed the publication of the paper he had been directed to found. They met every day and finally the Japanese proposed to him that he enter into relations with the publishers of the "Golos Japanii." Mr. Ueda and Kaneda, of whom we have already spoken, and to work together with them. Gortinski consented, and having spoken with Ueda and Kaneda several times, they decided to work together on condition that Ueda would be the official editor: he was to have charge of everything, the printing, the paper, the press, the office, etc., but was to have nothing to do with the editing of the paper proper, which work was to be done by Gortinski entirely. It is evident that the officers of the Japanese General Staff, not knowing Gortinski, feared to give him any considerable sum of money—because it is again the General Staff which was to furnish the money for the paper. Finally, Ueda and Gortinski went to the General Staff and submitted their plans for the paper to Mr. Kouvasi(?). The character of the paper was entirely changed: it was to be a paper for circulation principally in Russia to inform the Russian people of all good things the Japanese had done for them, what are their customs, and to enhance the necessity of Russo-Japanese friendship, etc. Briefly, it was to be a propaganda paper not only in favor of Semionoff but of the Japanese also. The plan pleased and was well received. They then asked for 5,000 yen a month. With this money they were to print small pamphlets in Russian to be sent to Siberia, the purpose of which was propaganda among the Russians for the benefit of the Japanese and Semionoff. Naturally the paper itself was also to be freely distributed in Japan. This periodical was to appear once a week and from thirty-five to forty thousand copies printed. The first month 30,000 copies were to be distributed free. The plan was then submitted by Kouvasi to the Minister of War. Up to the time I left Japan no reply had been received from the Minister.

According to Semionoff's instructions, Gortinski, who is to act as editor only for the present, by next spring will be able to dispense

with the Japanese Ministry as well as Ueda and take the entire management into his own hands.

As to Gortinski's relations with the Japanese press and journalists, he did well. Through a Mr. Kato, for whom he had a letter from Colonel Kurosawa in Chita, he established relations with the "Kokumin," the "Osaka Asahi," and other papers. The "Asahi" published his photograph and a biographical sketch. Thus men came to interview him and he wrote a few articles for the Japanese papers. "Golos Japanii" met his wishes by publishing an article very favorable to Semionoff (in No. 10, for the month of October). As to the lectures, up to now he had no success. The Japanese do not like to pay for such things.

General Nikonoff, Semionoff's representative gave Gortinski some money; the first time, on 22 September, 1919, 200 yen, the second time before his departure for Chita, 15 November, 1919, 500 yen—in all 700 yen in the money of the Bank of Korea. Maria Michailovna also gave him 150 yen. In all he received 850 yen which is very little in comparison with the large sums received by the other persons of Semionoff's entourage. General Nikonoff and Lieutenant Colonel Wlassievski promised to send 1,000 yen more for his extraordinary expenses as soon as they reached Chita.

Gortinski also occupied himself with another affair of great importance, although this has nothing to do with his duties proper.

We have already stated that the numerous Russians (employees of different kinds and those who were forced to come to Japan on account of political conditions in Russia) are opposed to Semionoff. At the head of Semionoff's enemies are the members of the Russian Military Mission in Japan, especially the chief of the Mission, General Podtiaguin. This general had been last year when Semionoff was fighting the Bolsheviks on the Manchurian frontier, in communication with the Bolshevik Government at Petrograd. In the month of February, 1918, he sent a young Russian officer serving under him, a Mr. Krijanovski, to Petrograd. This latter took with him about 100 packages (a list of which he kept) addressed to the different Bolshevik establishments and after having safely crossed the line dressed as a laborer in company with a crowd of laborers who were returning to European Russian from Harbin, through Manchuria, he arrived in Petrograd, which place he again left in the month of April, 1918, bringing to Podtiaguin an order from the Bolshevik Government according to which he was to continue as chief of the Russian Military Mission in Japan, but under the Bolshevik Government.

The document which Krijanovski received from the Bolshevik Government at Petrograd partakes of the character of a general pass and is dated in the month of April, 1919. Krijanovski returned

to Japan the latter part of May, 1919, and from that date General Podtiaguin continued as chief of the Bolshevik Mission in Japan. This did not prevent him from recognizing Kolchak's Government when he became strong, and trying to establish friendly relations with Semionoff, notwithstanding the fact that he had sent his officer on the above mission at a time when Semionoff was already in bitter struggle with the Bolsheviks. Alas! this is the misfortune of Russia to see, not only ignorant and insignificant individuals but high officials and generals, act not as their conscience dictates, but to their own advantage and personal interest, even if this should lead them to make common cause with the brigands. When Lieutenant Colonel Wlassievski came to Japan, General Podtiaguin called on him at the Seyoken Hotel where he lived to offer him his services on behalf of Semionoff. But Podtiaguin was already known (although he was not allowed to notice it), and this was known, thanks to Gortinski.

This latter, having not the material means when he came to Tokyo to live in a hotel, hired a room for 250 yen a month (for two persons, himself and his wife, who came with him to Japan) in the very house Krijanovski who now was in Tokyo and not far from Yurakacho Station, a commission office and several furnished rooms which he rents to the Russians coming to Tokyo. It was by chance that Gortinski went to live with him, and after a few days they became friends. Krijanovski, who as yet does not know that Gortinski is an agent of Semionoff and believes him to be a newspaper correspondent for different Russian papers, having quarreled with Podtiaguin several months ago, wanted to avenge himself on this latter, and began to relate to Gortinski how Podtiaguin, when the Bolsheviks were in Siberia, sent to them from Japan, by force, the Russian naval and infantry officers, notwithstanding the fact that they did not want to serve with the Bolsheviks. Gortinski listened to him attentively and made notes of everything Krijanovski, who knows a great deal, told him and then made him show the documents, which he then immediately copied. He then asked of Semionoff (through Wlassievski and Nikonoff) a considerable sum of money for the purchase of the documents and to enable him to continue his researches, as Krijanovski promised to give him documentary proofs which would compromise not only the Russian Military Mission to Japan, but also a number of Russian individuals, including several members of the Russian embassy. He has a lot of documents himself and some in the hands of his friends.

A few days before my departure the Japanese police came to Krijanovski's house and demanded the documents concerning Podtiaguin, and they only took from him insignificant papers, and he was able to conceal and keep everything he had of any importance. It

is for this reason that Nikonoff gave Gortinski money and promised to send him more.

These are Gortinski's occupations: The General Staff on one hand and Krijanovski on the other. This, however, does not prevent him from writing numerous articles for the Russian papers in Siberia and the Japanese papers of Tokyo.

* * * * * * *

What do the Japanese profit by aiding Semionoff?

In the beginning of August, 1919, General Nikonoff came to Japan and stopped at the Oriental Hotel in Yokohama. This general, since he graduated from the Military school at St. Petersburg 20 years ago, has always served in the Cossack artillery in the Transbaikal District. He has been a great friend of Semionoff for a long time and enjoys his entire confidence. His position with Semionoff is now that of a general on special duty. He came to Japan directly from Shanghai, China, where he had charge of settling the affairs of one of Semionoff's agents, of an officer who had spent several thousand roubles of Semionoff's money and then had escaped to South America.

In Japan, General Nikonoff as representative of Semionoff, had a special mission, *very delicate and very secret*. It is contemplated to found a commercial association, with a large capital for the purpose of exploiting all the resources of Transbaikalia. This company, according to plans, is to take over the entire commerce of the country. It is to have factories, stores, etc. There is a great deal of wealth in the mountains of Transbaikalia; among others, much gold. Briefly, everything is to pass into the hands of this company. The company is to have only Russian and Japanese shareholders; in one word, it is to be a Russo-Japanese company.

From the first day of his arrival General Nikonoff entered into relations with Japanese merchants and some Japanese establishments.

But here we must make a short digression:

For over one year and a half there has been living in Yokohama, Japan, Bluff No. 220–C, a certain Russian general, Mr. Tolmatchoff, exgovernor of Odessa. He is an old Russian monarchist, a personal friend of Nicholas II, and had to flee from Russia when the revolution broke out in 1917, because Kerensky wanted to have him arrested and imprisoned as a high official of the old régime. After many tribulations, General Tolmatchoff with his wife and two daughters crossed Bolshevik Russia (the voyage lasted several months) and arrived in Japan in 1918.

There also lived in Japan, for a long time, another Russian monarchist, Colonel Zavoiko, a man of much spirit and strong will.

A few months before the arrival of General Nikonoff, Colonel Zavoiko had been studying a project almost identical to that just mentioned. But being an honest man and a true patriot, having in mind only the welfare of the Russian people and not his own, the end he sought was entirely different. He associated with General Tolmatchoff in his project, and the two had been working on the plans for several months, and had almost accomplished the desired end when Nikonoff arrived, and, so to say, mixed all the cards for them.

According to the plan of Zavoiko and Tolmatchoff, a Russo-Japanese company was to be founded to revive commerce throughout Siberia, but only 50 per cent or half of the shares were to be sold to Japanese, the others being reserved for the Russians. As the Russians have no money now to pay for half of the shares in advance, i. e., to take at once 40 per cent of the shares, these were to be placed in the hands of the Japanese, but on condition that the Russians have an absolute and exclusive right to buy up 50 per cent of the shares. The staff of the company from the very beginning was to consist of an equal number of Russians and Japanese. Thus one-half of the directors were to be Russian from the start, notwithstanding that their one-half of the shares have not been paid for.

There is in Japan, at Tokyo, a Japanese business man named Mr. T. Mori. He has a small office at the Yamagata Hotel in Tokyo which he calls "Comptoir Russo-Japanais." This Mr. Mori pretends to be a great and sincere friend of Russia and to do business only with Russians. He is a member of the Seiyokai political party, and has connections in all circles of Japanese society, principally among financiers, but also among members of high society. He spends a great deal of money right and left, and appears to be very wealthy. There is not a day that he does not give a dinner to some Russian in one of the Tokyo restaurants, and these dinners must cost a considerable amount of money, as they always include champagne, Geisha or dancing girls, flowers and automobiles, which are expensive. Some days he gives as high as two banquets, and during my stay in Japan I have seen him do nothing else but give banquets. It is in restaurants that all the business with his clients is transacted. Is this man an honest man? I do not know, and doubt it, because I also, like all the Russians who come to Japan on business, began with Mr. Mori. It is he who proposed to become the printer of the paper I intended to found, because, he said, he had his own printing establishment; and two weeks later he even told me that he had already bought a machine for the manufacture of Russian type. There remained nothing to do but begin, I even had ready all the articles for the first number, but he fooled me, although I had already spent

1,000 roubles in the preliminary work, which was no easy matter for me! When I related this to Kato, the Japanese journalist, he asked me: "What Mori? The one who has a make-believe office at the Yamagata Hotel? But he is a trickster, a well-known swindler! Ask Captain Sebo, he knows him. He has no printing establishments at all. When he discovers that he can not get anything further out of you he will drop you and avoid meeting you."

Alas! Mr. Kato was right, and Captain Sebo confirmed his statements.

Well, it is precisely with him that Tolmatchoff and Zavoiko began their business. He was the intermediary, not only between them and the financiers, but also between them and the Government ministers.

General Tolmatchoff and Colonel Zavoiko, especially the first, drafted all kinds of projects, which they gave to Mr. Mori for him to submit to the Japanese ministers.

Before the arrival of General Nicholas Vlasilievitch Nikonoff the matter had been almost settled with the Japanese, and a commission of Japanese merchants and financiers was about to leave for Russia, headed by Tolmatchoff and Zavoiko, to settle the details in Siberia. They were to interview Kolchak and the different Russian Ministers at Omsk, Semionoff at Chita, and the different representatives connected with Russian commerce and industry. They were to be accompanied by the Japanese orthodox priest of the Tokyo Cathedral, Mr. Mii, and the rector of the Russian Seminary, which is now closed, as the religious mission receives no money on account of political conditions in Russia. (It was formerly supported by the Russian Government.) Mr. Mii made his studies over 20 years ago at the University of Kieff and knows the Russian language well. He is the interpreter for the Russian Telegraphic Agency in Japan, and all the other Russian establishments in Tokyo. Briefly, he is a person whose services can not be dispensed with in the transaction of business with the Japanese. It was he that translated all the proposals prepared by Tolmatchoff for submission to the Japanese.

Well, everything was ready for the departure of the commission for Russia when Nikonoff arrived. He had probably learned what was being done by Tolmatchoff and Zavoiko, as on the day following his arrival he was already associated with Mori and Mii, and the three were seen together every day afterward. The meeting of the two generals, Tolmatchoff and Nikonoff, gave rise to a quarrel between them. Tolmatchoff accused Nikonoff of cheating him out of the business which he had spent months of hard work in preparing and which he had almost completed. However, the Japanese did not break with Tolmatchoff at once and continued to discuss the proposition with him, but they gradually turned to Nikonoff.

In the month of September, a few days before the arrival of Maria Michailovna in Japan, Nikonoff went to Vladivostok to see Semionoff before he left for Chita, to report to him what he had done and to receive further instructions.

Upon his return to Japan three weeks later things proceeded apace. General Tolmatchoff was dropped in a few days, and as a compensation received permission to proceed to Omsk to obtain a position there, as he had no way of making a living after he had been eliminated from his commercial undertaking. Colonel Zavoiko, disgusted with the procedure and unreliability of the Japanese, left for America. He is reported to have said that he had finally been convinced of the lack of honesty and sincerity of the Japanese; that he had made a mistake in proposing this business to them; that he now would propose his plan to the Americans.

A new expedition to Russia was now prepared, but now headed by General Nikonoff. This new commission consisted of General Nikonoff, his adjutant, an old engineer, a mountain specialist of French descent, but speaking Russian very well, Mori, and eight Japanese. The commission left Tokyo on Saturday, 18 October, 1919, and embarked at Tsuruga 19 October. According to the expressed wishes of the Japanese it was to stop four days in Vladivostok and be in China 1 November.

When I learned that Nikonoff transacted all his business through Mori, whom I knew to be a great swindler, I warned him several times of the character of the man he was dealing with. Once or twice the general seemed alarmed, because, he admitted, Mori's conduct seemed strange at times, and feared to be duped as others had been before; but toward the last he warmly defended Mori and finally accepted him as the head of the Japanese going with him to Russia. So, Semionoff succeeded in taking this business of the exploitation of the wealth of Trans-baikalia into his hands.

We will now say a few words as to the arrival of Colonel Wlassievski in Japan. As we have stated, Colonel Wlassievski is the chief personnel officer of Semionoff and his most intimate friend. Semionoff places unlimited confidence in him and even allows him to act in his name. Wlassievski received his position and obtained his influence over Semionoff through Maria Michailovna. He is a man between 35 and 40 years of age, a Transbaikal Cossack by birth, very shrewd and very dangerous, although nice and pleasant to everybody. There is no doubt that with the help of Maria Michailovna he holds Semionoff in his hands and has an enormous influence over him.

Well, a week after the departure of Maria Michailovna and her suite from Tokyo he arrived suddenly and unexpected by any, even

Nikonoff. Wlassievski came to see me as soon as he arrived, but not finding me home, left word for me to call on him at the Seyoken Hotel as soon as I returned. When I called on him he discreetly explained to me that he had come to Japan on two missions: 1. To investigate the conduct of Maria Michailovna in Japan, regarding which Semionoff had received very bad reports. 2. To see the Chief of the Japanese General Staff and take up with him the matter of sending to Tokyo Semionoff's Military Mission, to consist of a representative and two secretaries; which mission was to remain there permanently.

Regarding the first question he informed me that he had obtained very bad information as regards the woman's conduct. "But," he asked, "is it true?" I said "Yes," that the conduct of the person in question reflected very unfavorably on Semionoff, not only because of the company with which she constantly surrounded herself, which included even thieves of her former acquaintance, but also on account of what she said about Semionoff and what she told me and other Russians in the presence of Japanese, as well as in the presence of persons she had never seen before. As an example, I related to him the conversation that took place in the automobile when the lady was returning home from the banquet given in her honor, which was attended by Tolmatchoff, Mori, Mii, and myself. She stated that formerly Semionoff was nothing but a "bandit" and he owes everything to her, and if it was not for her his business would not prosper, because he loves her very much and listens to her advice; that every one of his generals and officers who are against her are immediately dismissed, etc.

All this would have appeared to me like the babbling of a drunken "cocotte" if I had not known that, unfortunately, this woman exercises a powerful influence over Semionoff; because he loves her passionately and she knows too much about his past. Therefore, I did not hesitate to tell Wlassievski that as I had seen and knew everything, I was of the same opinion as those numerous persons who say that this woman will be Semionoff's perdition and that she does and will continue to do considerable harm to the Russian people; because it is the nation's money which is being spent for those furs, diamonds, necklaces, pearls, etc. I was rather surprised to hear Wlassievski speak as he did, because I know perfectly well that up to then he had been a great friend of Maria Michailovna and that nothing had heretofore interrupted this friendship. I still believe that this was a mere comedy on his part to find out my opinion, because I had always opposed her, and when in Chita I had publicly spoken against her. But it was very difficult to have a liquidation because I was very popular in Chita; I was a clergyman and the scandal would have been too great. The people liked me and my influence with

them was very great. It is also possible, I must admit, that the people of Chita are beginning to realize the danger of having this woman near Semionoff because: 1. The dissatisfaction of the public and of the officers, including those heretofore most devoted to Semionoff, on her account, is becoming greater every day. 2. Once perfectly installed in her new rôle of "Queen of Transbaikalia" like a vulgar and spoilt woman she would become more and more audacious, behave worse and worse and further compromise Semionoff. It is also possible that it has been decided to get rid of her in one way or another. We have already mentioned the incessant intrigues around Semionoff and struggle between different factions. More than one of these factions is dissatisfied to see this "hussy," known as such for many years by everybody, who has dined and * * * with many officers at Harbin before she had become "Madame Semionoff," to see this Bohemian Mary in power, to see her yell at the officers of the Russian Army! I am persuaded that she will not last much longer; such a condition is not normal.

In speaking of Semionoff's mission to Japan, Wlassievski said: There will soon be many of us here—and then he asked me to accept an official position in Japan as Semionoff's representative. He, as well as Semionoff, had heard that I was well liked by the Japanese. I replied that I not only refused any new position but my intention was to shortly retire from all political work: that I had enough. (I was wrong in telling him this, because a few days later I was forced to throw up everything and to leave Japan.)

Immediately after having spoken to me Wlassievski went to the General Staff, and when I saw him on the same day before his departure, about 5 or 6 p. m., he informed me that the Chief of the General Staff had given him a most cordial reception; that the Japanese Government would be pleased to have Semionoff's mission at Tokyo, and that he would take up the matter with Semionoff as soon as he arrived in Chita, and that the mission would be sent in a few days and take charge of all the affairs between Semionoff and the Japanese Government. Wlassievski left Tokyo at 7.30 p. m., 13 October, 1919, and was due to arrive in Chita the 26 of October.

To complete this chapter, there only remains to relate the story of the sojourn of the so-called Madame Semionoff in Japan. An interesting story, which shows not only how the Russian people are being imposed upon on the pretext of saving it, but also how shrewd and how false are the Japanese, as well as their intentions as regard Russia.

We will lay stress on some essentials which at first sight may appear insignificant, but which are full of meaning if we remember

who Maria Michailovna is and that the Japanese know it perfectly well.

On a fine day in the beginning of September the Japanese papers announced that the wife of Ataman Semionoff, together with several ladies of her suite, was about to land at Shimoneseki.

On this same day Messrs. Mori and Mii, above mentioned, asked me if I knew Madame Semionoff. I replied that I had never seen Semionoff's wife, as she was not at Chita, and that, as to Maria Michailovna, I had seen her once, but I had no relations with her. Mr. Mii, who is a priest like myself, I politely informed that I did not believe it proper for a priest and monk like myself to have any dealings with such persons, except when met officially. Mii appeared rather confused at first, but after a few moments said: "You are right, Father Filofey, in principle, but as General Semionoff calls her his wife, and, as we esteem him, this is none of our business. We want to please him and we must not bother about her status. Our minister has ordered that Madame Semionoff be met on her arrival and that she be received with all solemnity and civilities." To this I made no reply.

Two days later the Japanese papers published the news of the arrival of Madame Semionoff along with her photograph. According to the papers she was accompanied by several ladies and gentlemen and by Captain Sebo, of the Japanese General Staff. Captain Kuroki, the son of the famous general by that name, assisted by several officers, went to meet her at Shimonoseki when she landed. The papers announced that after a short stay at Shimonoseki Madame Semionoff would come to Tokyo and stop at the Seyoken Hotel. (Wlassievski told me that Semionoff had strictly forbidden her to go to Tokyo: that he had allowed her only to go to Japan to spend two weeks at Atami—a village four hours outside of Tokyo. According to Wlassievski, it is against the will of Semionoff that she came to Tokyo and spent two weeks there.)

On the eve of her arrival Mori and Mii again asked me if I knew her. I replied that I had already answered their question.

Then Mii explained that Mori would like to give her a dinner in the name of some Japanese merchants and thus do something agreeable to Semionoff, whom he would see soon in Russia. I replied that I doubted that I should meet here in Tokyo, but I was mistaken.

On the day of the arrival of Maria Michailovna, Tuesday, 10 September, 1919, I spent the day at Yokohama, where my nephew was studying at St. Joseph's college and lived at the house of General Tolmatchoff, of whom we have just spoken.

Upon my return home in the evening, about 9 o'clock (I lived at the Imperial Hotel, Tokyo), I was told that a woman, accompanied by an officer, had been there about 4 o'clock in the afternoon and

had asked for me. Although she did not leave her name, the hotel employee to whom she spoke said that he thought it was Madame Semionoff. The Cossack officer who accompanied her was known; this was the young Lieutenant Boris Ivanoff-rinoff, son of the now celebrated General Ivanoff-rinoff, chief of the Siberian Cossacks and Count of Omsk. This young man had been under treatment two or three months at the hospital of the Tokyo University, and had recently been living at the Seyoken Hotel. The Japanese were exceptionally civil to him, and a Colonel Vlazinski, who came to Japan for his health at the same time, told me that when he embarked on a Japanese transport at Vladivostok on his way to Japan a Japanese officer came on board and gave him 1,200 yen in Japanese money as a present from the Government for his expenses in Japan. Being on friendly terms with Semionoff, the first days of Maria Michailovna in Japan, he frequently called on her, but, according to his own statement he became so disgusted at her conduct that he later avoided her.

I immediately telephoned to the Seyoken, but Ivanoff-rinoff was not at home so I put off the matter until the following day.

The next day I learned that it was in fact Maria Michailovna who had called on me during my absence, and that she desired to see me that evening at the Seyoken Hotel. I was at first surprised at this request as I had always been her bitter enemy, and she knew this well, because when I was still at Chita I was warned several times of the danger that threatened me on her account, for which reason I had to hasten my departure for Japan. However, it was also possible that she had a message for me from Semionoff, and I therefore decided to go to see her.

But I was delayed at home on business till 10 o'clock in the evening of the 11th, and when I arrived at the Seyoken, Maria Michailovna had already left for the theater, where the Russian opera Boris Godounoff was being played.

At the Seyoken Hotel I met the then Minister of Supplies of the Omsk Government, Mr. Guerasinoff, who said that he was pleased with Maria Michailovna and offered to accompany me to the opera. I accepted and, jumping in my automobile which I had left below, in a few minutes we were at the theater. Guerasinoff told me that the Japanese Government had reserved two boxes for Maria Michailovna and her suite. (The opera was at the Imperial Theater.) We arrived at the time of the recess, and Maria Michailovna left her box to come to meet me in a most friendly manner. The woman is a good comedian. I was thoroughly surprised at her appearance; she is usually rather stout, features somewhat vulgar with Semitic traits in both face and manners, but this time she was almost unrecogniz-

able—slender, elegant, of striking beauty, all wrapped up in silk, furs, lace, and with a dazzling pearl and diamond necklace.

On the following day when I saw her in her room I realized that this miraculous beauty was due to cosmetics and other things, and I was completely stupefied and unable to understand how Semionoff and many other men stronger than he could lose their heads over this woman.

We went to a table to take tea, and then Maria Michailovna asked me to take her home in my automobile as she wanted to speak to me. On our way from the theater she begged me to come to see her about 11 the following day.

On this same evening I learned who were the people that came with her to Japan. There were three ladies, all so-called widows: the former wife of Wlassievski, abandoned by her husband (her name is Olga Andreievna), the former wife of Mr. Linkoff, the would-be historiographer of Semionoff (he has just completed a book dealing with the history of Semionoff and his struggle against Bolsheviks. He had already written a small book on the same subject, but the one he has just finished is much larger, having worked on it for several months), also abandoned by her husband, and finally Mrs. General Antonovitch (also abandoned by her husband). General Antonovitch is now commanding a regiment in European Russia. In addition to these three women the suite of Maria Michailovna consisted of a Mr. Issakaroff, of whom we shall speak later, and of Captain Sebo already mentioned. She also brought with her a boy eleven years of age, the son of the so-called Prince of Tambouir-Malinovski, abandoned by his parents, each of whom leads his own life, the father at Harbin as representative of Semionoff and the mother at Hailar. I took charge of this poor child, terribly spoiled for his age (he saw and heard everything, and in his presence things were said which any honest man would never repeat), and put him in school at St. Joseph's College, and gave him my nephew's room at the house of General Tolmatchoff. It might be said that of all the members of the suite of Maria Michailovna, Captain Sebo was the only decent or honest person. I do not except Mr. Issakaroff, for he also is abandoned, but this time by society. I can not remain silent on this rare friend of Maria Michailovna. I saw this Issakaroff that evening at the theater for the first time. On the way to the theater Mr. Guerasinoff asked me who Issakaroff was and I replied that this was the first time that I had heard the name. On our return from the theater I asked Maria Michailovna who this person was (had no doubt that he was Jew, as his accent and his features showed it plainly). She explained that Issakaroff was a well-known millionaire from Turkestan; that he had enormous plantations in Bukara, numerous factories in Tashkend, many factories, houses and

office buildings in Moscow; that notwithstanding the fact that the latter, in Moscow, had been destroyed by the Bolsheviks, he is not poor. That he is now in an enormous business in China and lives in Shanghai. This man, she said, formerly loved her very much and had committed many follies on her acount. She said they owed him a large sum of money, as it was he who paid for her trip to Shanghai a few months ago. It must be remarked that she did not say "I owe him" but "we owe him," and this might lead one to believe that it was she and Semionoff who owed him. She was so earnest in telling this story that I believed her. Thereafter when I met this individual almost every day, at the hotel of Maria Michailovna, he told me a great deal about his business with an air of great assurance, and I continued to believe the story. But one fine day I learned the truth.

I beg forgiveness for this interruption of my narrative, but the story is too striking to pass by in silence.

There lived in the same hotel as I, for a long time, nearly as long as I, a Mr. Shkolnikoff, a medical student of the Omsk University, a Jew, and the son of a very wealthy merchant at Irkutsk. I knew his stores at Irkutsk, and know him to be an honest young man, very serious, almost too serious for his age. He had been wounded in a battle with the Bolsheviks and had come to Tokyo to undergo an operation. Briefly, I know him to be a man worthy of credence. Being born in Irkutsk he was familiar with everything that happened there. It is he that knew that Maria Michailovna had never been the wife of the vice governor of Tambox, as she claimed; also that she was not the daughter of a Russian peasant of Tambox, but a Jewess from Irkutsk, pure and simple: that her family name was Rosenfeld; that still very young she abandoned her family to become a prostitute; that thanks to her beauty and her wealthy protectors she became a singing girl in the café chantant; he stated that he had dined with her more than once at the cafés chantants of Irkutsk and Harbin.

One day, about a week after the arrival of Maria Michailovna at Tokyo, while speaking to Shkolnikoff, I happended to mention the name of Issakaroff.

"What Issakaroff?" he asked suddenly.

I showed him the photograph that my nephew had made of him, at my request, in the room of Maria Michailovna at the Seyoken Hotel.

"Did he not tell you about his wealth in Turkestan?" he asked.

"Yes," I replied, surprised.

Then he told me that this Issakaroff is a common thief. Taking advantage of the fact that in Turkestan there is a family of the same name as his, but not related to him, he tells everybody that he is the son of merchant Issakaroff, although he is in no way related

to him. Irkutsk is a long way from Turkestan, and he found people who believed him. The Jews of Irkutsk, naturally, knew that this was a lie. The real profession of Issakaroff is to cheat at cards in the clubs (for which he has been beaten several times), and pimping. He ordinarily lives with women from the cafés chantants.

Shortly before the departure of Shkolnikoff from Irkutsk, the Jewish community was greatly stirred by a misdeed of Issakaroff. He lived with a young Russian artist of the café chantant. This woman had much success on account of her youth and beauty, and consequently had plenty of diamonds and gold. One day Issakaroff disappeared from Irkutsk with all her jewelry. Now Shkolnikoff found him in Tokyo as the intimate friend of Madame Semionoff. Then I understood a certain scene which I had witnessed a few days previously between Maria and Issakaroff when in her room. She entered the room and was uneasy because she had forgotten her necklace on the table, and in a severe tone she asked Issakaroff where her necklace was. The man meekly replied that as soon as he saw the necklace he took it to the office, and handed her the receipt. She knew her friend well.

A few days later we learned that Issakaroff was an old lover of Maria Michailovna (he openly and in the presence of everybody showed that he was jealous of her during their stay in Tokyo), and that he had met her at Harbin, after having escaped from Irkutsk, and thanks to her protection was able to enter Japan, to go from there to Shanghai, where he was going for the first time. Maria Michailovna and Issakaroff traveled together as far as Shimonoseki, where she embarked for Chita and he for Shanghai.

On another occasion I saw with my own eyes the following scene: During the absence of General Nikinoff, I went to the Oriental Palace Hotel at Yokohama to inquire about him. On leaving the office I saw, in the lobby, Issakaroff in the company of a number of Jews and Jewesses; the latter had all the appearances of sporting women, and the whole crowd, in general, looking very doubtful. I heard one of them say: "We are going to have a jolly time to-night; your Machka (pet name for Maria) will not be late."

Again on another occasion, on a sultry day, having gone into the bar of the Oriental Palace Hotel for a glass of fresh water, I saw two young Jews, between 17 and 18 years of age, playing dice. One of them began to cheat and the other slapped him in the face, and they were both thrown out of the hotel. What was my surprise when, one day while at breakfast with Mr. Guerasinoff at the Hotel Seyoken I saw these two young men seated at the same table with Maria Michailovna and Issakaroff.

This is the class of people Maria Michailovna associated with in Japan.

We will now continue our narrative. On the morning of the 12th of September, before I left to visit Maria Michailovna, there came to see me Mr. Mii and Mr. Mori, who as yet were not acquainted with her. Mr. Mori asked me to invite her in his name to a dinner to be given at a Japanese restaurant, the best in the city of Tokyo, the Shiba Park Restaurant, at any time she would choose. I was also invited. The dinner was to be attended by only Mr. Mori and his family (two daughters, 22 and 7 years of age), Tolmatchoff, Mii, myself, and a few Japanese merchants. There is no doubt that Mori would make profits out of this dinner, but as I was very curious to know what would take place, I willingly accepted the invitation.

At 11 o'clock I went to see Maria Michailovna, but not finding her home I waited for her to return as she had indicated in a note which she had left for me, telling me she had gone to see a doctor, and would return presently. On her return a number of persons came with her and we had no chance to talk. I had time, however, to inform her of Mori's invitation, which she accepted for the following day at 1 o'clock.

On the same day, Mori, Mii, and General Tolmatchoff came to see me and settled the details as to the dinner, and it was decided to give her a grand style dinner, i. e., with geishas, dancers, champagne, etc. Tolmatchoff and I already knew that Maria Michailovna was fond of drink, and that when drinking she loved to talk. That is why we were curious.

On the following day at 1 o'clock I went for her at the Hotel Seyoken and she and I went to Shiba Park. According to Japanese custom the first part of the dinner was most ceremonious. Everybody was seated on the floor, on large cushions. In the center were Maria and Tolmatchoff, and in front of this latter a large bowl full of punch made of 24 bottles of champagne, liquors, brandy, and fruits. The daughters of Mori first played a tune on a Japanese harp, then the elder sang in a loud and most disagreeable voice. The first toast was pronounced by Maria Michailovna to the health of Semionoff. It is at this time that she said that Russia had now a dictator imposed by the Americans and the English, but that the day would soon come when there would be another—created by the only true friends of Russia, the Japanese—and that he would save Russia from her misfortunes; this man will be Semionoff. The whole world knows his value, the Chinese are making him all sorts of promises, but he will remain faithful to the Japanese and only to the Japanese; because the Chinese did not help Semionoff when he was in need and the others, especially America, are the enemies of Russia. There were cases, she said, in which the American troops refused to defend the Russian people of the Amur villages against the Bolshe-

viks, against whom they refused to fight. Then she said: "In the name of my husband I invite everybody here present to come to Chita where they will be cordially received in his house."

After a few geisha dances and dances by dancing girls photographs of everybody were taken, some by flashlight, then Mori's daughters retired. After this drinking was indulged in freely, and in this Maria Michailovna showed herself at her best. She told dirty stories, intermixed with her affirmation that she was the "modern Josephine," that Semionoff did everything that she wanted him to, that if she did not take a hand in his affairs he would never succeed, because he is surrounded by rascals, but that these bad men are necessary because Semionoff is too weak and also too good.

When I took her back to the hotel in the automobile she invited me in. When we reached the room she locked the door and began to speak to me.

My God, what revelations I heard! I shivered as I listened.

She began by telling me that she knew perfectly well that I was her enemy.

"Yes," I replied, "and I also know that you wanted to kill me!"

"In the name of God and of my mother," she cried, "I swear that I have never been against you. Yes, *I admit that there are some persons that should not exist in this world, but you are not one of them.*"

Then she told me:

1. That without her Semionoff would amount to nothing. He was an ordinary bandit (prosti bandit) when she was still at the café chantant "Palermo" at Harbin. He once came to the café with some officers and he was short 800 rubles to pay his bill; she O. K.'d his bill, and this was the beginning of their friendship. She began to live with him without worrying where the money came from. She demanded a great deal of him, but nevertheless was unfaithful. She did not know him then as a "rare and brave soul."

2. In 1917 there was a great scandal in Harbin. The mayor of the city of Harbin, Mr. Volfovitch, was nearly killed. The malefactors entered his home at night, seriously wounded him, and did not kill him for some reason unknown to this date.

These malefactors were Semionoff and a few of his friends.

On a certain day they came to her home, where they concealed bombs and revolvers, etc. That night they came back in an automobile and took all of these things. A few hours afterward they again came back all covered with blood, and burned in her stove the rags with which they wiped their bloody hands.

3. There lived in Chita the wife of a general called Nazvaloff, who was Semionoff's representative at Vladivostok. In the spring of this year she disappeared. She left her home to go to a rendezvous,

for which purpose she had been sent a carriage, but by whom nobody knew. Madame Nazvaloff was known to every one as an ardent patriot, who was much upset on account of the happenings in Transbaikalia. When she disappeared many conjectures were made, but until the present time nobody knows what happened to her, as neither she nor her remains have been found. Her husband committed suicide a few weeks later by shooting himself in the head with a pistol.

Maria Michailovna told me that this woman was implicated in a conspiracy against her. In this she (Madame Nazvaloff) associated with herself a certain Colonel Stiepanoff, whom everybody knew as the greatest scoundrel and most conscienceless man in the whole of Transbaikalia. For the success of the affair she sacrificed herself and became Stiepanoff's paramour, but this latter was too devoted to Maria Michailovna and, one fine day, confessed everything to her. On a certain day Stiepanoff sent a carriage to get Madam Nazvaloff, and when she had undressed and was lying in bed, he pulled out his revolver and shot her. During the night her body was cut up into pieces and thrown into one of the numerous forests in the vicinity of Chita.

4. There was in Chita a gentleman by the name of Karaieff, from the Caucasus. Last year, when the Bolsheviks were still occupying Chita, in compliance with an order from a secret anti-Bolshevik organization, he went into the Bolshevik camp and succeeded in saving the lives of 17 Russian officers who had been condemned to death. When the Bolsheviks were driven out of Transbaikalia, Karaieff, together with many others, suspected of Bolshevism, were thrown into prison. But thanks to the efforts of a well-known lawyer of Chita, Mr. Villert, who succeeded in explaining his true rôle with the Bolsheviks and his real merits, he was given his liberty which he had been enjoying for more than one year. He had even married a young Russian woman, only 18 years of age. But Karaieff, who had been connected with secret societies for a long time, knew many things that no other persons knew, and which it was not desired to have him know. He also knew something about Maria Michailovna.

Just before my departure I met him, in good health, at the home of Mr. Villert, a man whose opinions are considered very sound and who is respected by everybody. Villert always spoke very highly of Karaieff.

Maria Michailovna told me that, thanks to her, many people were saved from prison and death because, she said: "In Transbaikalia the prisons were filled with innocent victims, most distinguished men, while rascals in large numbers are free." To my great surprise, as

an example of these rascals, she cited Karaieff. Then bursting out crying she added: "Yes; it is I who had him shot." (I did not know till then that he was dead.) "I told Semionoff that innocent people were in prison and this man, whom I knew for a long time, was at liberty. As a matter of fact, he was shot two weeks ago."

It was about this time that Gortinski came from Chita. Naturally, I made haste to question him on this subject. He then told me that on a fine day, when Karaieff did not even dream that he was in danger, an officer came to see him in the name of Semionoff to request a favor. An expedition was to leave on the following day for some point in the vicinity of Chita to capture some Bolsheviks supposed to be in hiding, but the officer in charge of the expedition did not know the road nor the country, and Karaieff, who knew the country around Chita thoroughly, was requested to please accompany the expedition as a guide. The unfortunate man, far from suspecting anything and not even dreaming of danger, consented, and on the following day when a Cossack came to get him, bringing a horse, he never hesitated.

He was never seen again!

All the efforts to find the officer who came to see him the day before led to no results; at headquarters nobody knew anything about the expedition. However, it began to be rumored in the city that he had been shot. On hearing this, his wife poisoned herself. "Well," concluded Gortinski, "it is whispered that he was killed, yet nothing positive is known."

Alas! I knew the truth. Thus perished a man without trial, after having felt himself out of danger for a year.

Maria Michailovna told me of still other massacres, but I no longer remember about them. I was listening poorly and was only thinking of retiring. Undoubtedly, if she had not had too much drink on that day she would not have told me all this. The proof of this is that two days later at the Seyoken, in the presence of other persons, she said, alluding to me, but addressing old lady Antonovitch, that she would find the means of getting rid of a man who should reveal anything she confided to him; that she would kill him with her own hands.

Why did she tell me all this? Was it because she was under the influence of alcohol, remorse, and troubled conscience (she was weeping bitterly)? Did she intend to show me that she was doing only good and, in spite of herself, ended by confessing her crimes? This I am unable to solve. The psychology of this woman is too complicated for me to understand it. But there was one thing that I understood: that is, that massacres are a common occurrence about Semionoff—even Colonel Stepanoff, the murderer of Madam Nazvaloff, was himself murdered a few days later. Semionoff does not

hesitate as to the means when it is a question of getting rid of some one.

After having visited the Japanese theater, upon Mori's invitation, Maria Michailovna herself gave a banquet, to which were invited all the persons who had attended the Shiba Park dinner, and all the members of her suite. But I had not the moral courage to remain until the end, and, under pretext of having to visit the children at the college, I retired.

She remained in Japan several days more, but I did not see her again. She left for Russia on the 6th or 7th of October. I knew that she spent her nights in great orgies, now at Tokyo, now at Yokohama, during which she did not stand on ceremony with regards to the women of her suite. I also heard that she visited the Japanese Minister and Assistant Minister of War, with whom she had a long personal conversation.

Semionoff seemed to be uneasy, because every day he sent her telegrams calling her back home.

While in Japan Maria Michailovna was informed by General Nikonoff, on his return from Russia (Vladivostok), that Semionoff did not want her to make the acquaintance of any Russian in Japan, because there was a conspiracy against her. The name of Abrikossoff, of the Russian Embassy, figured in this conspiracy. As to the others, I do not know them.

Before concluding this chapter something must be said regarding Japan's sentiments toward America.

It is true that in certain circles of Japanese society war with America is expected. Not only in Russia but also in Japan one may hear it said aloud that war between Japan and America is inevitable. It is also certain that a very large portion of the Japanese population is strongly opposed to war and the actions of the military party. This latter party is, however, very strong in Japan, and is now making an issue of the passing of the American fleet from the Atlantic to the Pacific, through the Panama Canal, by considering this as a menace on the part of America. It is also evident that the Japanese are preparing for war. It is known, for example, that they are building new warships as well as new fortifications in Korea and several new ones in Japan.

There is no doubt whatever that the Japanese will do everything in their power to prevent the Americans from gaining any influence in Siberia, as well as taking any part in their commerce, industry, and exploitation of her natural resources. True enough, they have no definite plan, it being impossible to have one at present; affairs in Siberia and in Russia are too complicated to foresee how they will end, and what they will lead Russia to. The Japanese, however, do everything they can to immediately profit by the circumstances as

they arise, be these what they may. It is possible, in their opinion, that circumstances will be such that they will be able to take full possession of a portion of Siberia: also that possibly they may have to be satisfied with a more or less considerable influence. If they now support Semionoff it is not through sincere affection or friendship for him personally, but they understand that circumstances may arise in which he may be very useful to them and that it would be unwise on their part not to be on good terms with him. They now hesitate to help him, as he would like to be helped—because they are awaiting developments. The situation is not clear.

They are also awaiting the turn of events to adopt this or that policy toward America. I now recall an episode which is very characteristic of the Japanese. This happened once when Gortinski and I were at the Japanese General Staff and speaking with Captain Kouvaki. I must here remark that Gortinski often showed himself devoid of the most elementary tact. Now, in explaining to the captain his plans and policy for the paper he intended to publish, he said, among other things, that he was going to try to turn the opinion of the Russian people against America, to benefit Japan by publishing articles showing how dangerous the Americans are for Russia and Japan. "But," Captain Kouvaki replied, "we are officially on friendly relations with America. How could we write against her in a paper for which we furnish the money?" "Have no fear, Captain; rely on our tact," Gortinski said: "we can always write more freely against America here than in Russia, because, for example, at Vladivostok the Americans have forcibly suppressed the paper 'Dalnii Vostok' for having published articles against them, and at Chita, I myself," continued Gortinski, "was prosecuted before the courts by the American consul." He then told how, being editor of a paper called "Vostoknii Kurier" at Chita, he wrote several articles against the Americans. That the American Consul complained to Semionoff, who, as we know, subsidized the paper. Semionoff replied that in Russia there were courts to settle such matters. Then the consul filed a complaint with the court, but Gortinski left for Japan before being cited to appear. After this story, however, Captain Kouvaki made him give his word that he would be very careful in what he wrote in his future paper, so as not to provoke unpleasantness.

However, no matter what the intentions of the military party may be, we must always remember public opinion in Japan. The numerous strikes of these last few days have greatly upset Japanese society; because, although it is now only a question of salaries and short hours, it is known: (1) That socialistic ideas are taking root in Japan—translations of Marx's and other socialists' works are on

sale in all the book stores; (2) that the Bolsheviks have spent enormous sums of money for propaganda in India and Japan. It is for this reason that every Russian, whoever he may be, a few hours after his arrival in Japan, is visited by police agents (Metropolitan Police Office, Department of Foreign Affairs), and if he is not an official, is followed by one or two plain-clothes agents at every step. Strikes also took place at the dockyards where the warships are being built and at the military arsenals. All these events are worrying a large part of the population, and the Government can not remain indifferent. Thus the struggle between these two parties over the labor and other questions is becoming fiercer every day. In fact the Government was forced to adopt a waiting policy as the only thing possible under the complicated circumstances, not only in Russia and Siberia, but throughout the whole world.

I doubt, I repeat, if Japan has any fixed policy and plan; they are ready for this and that. It may even be possible that an upheaval, if not a revolution, may take place in Japan—at least it is being spoken of. But, all the same, whatever may be the policy adopted by Japan, it will be dangerous for Russia and Siberia.

BRITISH NAVY LIST.

Source: Reliable.

January 1920.

Line and engineer officers.

Line officers:	
Admirals of the fleet	6
Admirals	12
Vice admirals	22
Rear admirals	59
Captains	370
Temporary captains	6
Commanders	597
Temporary commanders	18
Lieutenant commanders	728
Lieutenants	1,495
Acting lieutenants	321
Temporary lieutenant commanders	10
Temporary lieutenants	25
Temporary acting lieutenant	1
Lieutenant commanders, supplementary list	6
Lieutenants, supplementary list	57
Sublieutenants	636
Acting sublieutenants	28
Total number line officers	4,397

Engineer officers:	
Engineer in chief of fleet	1
Engineer rear admirals	10
Engineer captains	40
Engineer commanders	381
Temporary engineer commanders	4
Engineer lieutenant commanders	173
Temporary engineer lieutenant commanders	7
Engineer lieutenants	213
Acting engineer lieutenants	45
Temporary engineer lieutenants	338
Temporary engineer sublieutenants	17
Total number engineer officers	1,229
Total commissioned line and engineer officers exclusive of commissioned warrant officers	5,626

Staff and warrant officers.

Mates:	
Mates	116
Midshipmen	581
Mates (E.)	41
Temporary mates (E.)	8
	746
Chaplains:	
Chaplain of the fleet	1
Chaplains	94
Acting chaplains for temporary service	104
Honorary acting chaplains	14
Acting Wesleyan chaplains	4
Acting Baptist, Congregationalist, Primitive Methodist, and United Methodist	1
Acting Roman Catholic chaplains	21
Instructor-captains	2
Instructor-commanders	36
Temporary instructor-lieutenants	54
	331
Medical officers:	
Director general of medical department of the navy	1
Surgeon rear admirals	5
Surgeon captains	15
Surgeon commanders	264
Surgeon lieutenant-commanders	97
Surgeon lieutenants	77
Temporary surgeon rear admirals	5
Temporary consultant physicians and surgeons	2
Temporary surgeon commanders	3
Temporary surgeon lieutenants	723
	1,192

Paymaster officers:	
Paymaster director general	1
Paymaster captains	18
Paymaster commanders	205
Paymaster lieutenant commanders	198
Paymaster lieutenants	232
Paymaster sublieutenants	52
Paymaster midshipmen	49
Paymaster cadets	15
	770
Shipwright lieutenant commander	1
Shipwright lieutenants	27
	28
Ordnance lieutenants	2
Warrant officers:	
Headmasters	4
Chief gunners	425
Gunners	1,115
Temporary gunners	13
Chief boatswains	115
Boatswains	279
Temporary boatswains	3
Chief signal boatswains	34
Signal boatswains	53
Commissioned telegraphists	5
Warrant telegraphists	63
Temporary warrant telegraphists	4
Commissioned masters-at-arms	3
Chief masters-at-arms	7
Temporary chief masters-at-arms	4
Acting warrant officers	3
Commissioned shipwrights	100
Warrant shipwrights	189
Temporary warrant shipwrights	12
Chief artificer engineers	236
Artificer engineers	513
Temporary artificer engineers	33
Commissioned mechanicians	16
Warrant mechanicians	70
Commissioned ordnance officers	7
Warrant ordnance officers	16
Temporary warrant armorers	5
Commissioned electricians	7
Warrant electricians	56
Senior masters (commissioned warrant rank)	15
Schoolmasters (commissioned warrant rank)	7
Schoolmasters (warrant rank)	77
Temporary acting warrant schoolmasters	204

Warrant officers—Continued.	
Commissioned wardmasters	2
Warrant wardmasters	15
Commissioned writers	15
Warrant writers	65
Temporary warrant writer	1
Commissioned victualing officers	11
Warrant victualing officers	41
Commissioned instructors in cookery	3
Instructors in cookery	9
Keepers and stewards of the royal cabins in his majesty's yachts	2
	3,857
Total staff and warrant officers	6,926
Total line and engineer officers	5,626
Grand total	12,552
Enlisted personnel (approximate)	146,000

FRENCH NAVAL PERSONNEL.

Source: Reliable.

30 September 1919.

Total number of enlisted men	62,000
(Shortly to be reduced to 48,000.)	
Total number of line officers	1,715
The above includes: Flag officers, 44; captains, 120.	
Officers of separate Engineer Corps	473
Total number of officers (line plus engineer)	2,188

ITALIAN NAVAL PERSONNEL.

Source: Reliable.

27 September 1919.

Total line enlisted personnel	51,000
Line officers	1,188
Line officers include: Flag officers, 44; captains, 64.	

JAPANESE NAVAL PERSONNEL.

Source: Reliable.

8 September 1919.

Enlisted personnel	70,260
Total line officers	2,493
Line officers include: Flag officers, 122; captains, 135.	
Officers of separate Engineer Corps	900
Total number of officers (line plus engineer)	3,393

S. S. "IMPERATOR."

Source: Reliable.

21 January 1920.

(3965.)

When the S. S. *Imperator* arrived at Southampton, England, on 21st December, 1919, a great deal of criticism was in evidence amongst the passengers who made the voyage on that vessel. These criticisms may be outlined in general as follows:

(*a*) Vessel not clean.
(*b*) Stewards and stewardesses inefficient.
(*c*) Shortage of fresh water.
(*d*) Quality of food not satisfactory.
(*e*) Exceedingly slow passage made.
(*f*) Ship not turned over to Cunard Line in satisfactory condition.
(*g*) Lack of knowledge of the crew with regard to the operation of engines and auxiliaries.
(*h*) In addition to the foregoing, there were various "galley rumors" to the effect that there were many serious leaks in the vessel, and that there was a good deal of pro-German sentiment aboard. Some of these rumors even went so far as to indicate that German agents had committed some form of sabotage on the vessel, even at this late date.

With regard to (*a*) and (*b*), it appears that these criticisms might well be covered by the statement that many of the stewards and stewardesses signed up for the voyage in order to get back to England for Christmas, many of them had little or no previous experience.

No comment is necessary with regard to (*d*).

With regard to (*c*), (*e*), and (*g*), it is understood that considerable difficulty was encountered in obtaining more than 13 or 14 knots, due to lack of familiarity of the engineer force with the engines and auxiliaries. This, of course, necessitated a much longer passage than anticipated, and fresh water had to be conserved accordingly. Furthermore, it was discovered after the vessel had been to sea a short time that her stability was not entirely satisfactory. The vessel took a list of about 12° and tended to maintain this list for an unusual period of time. The officers of the vessel apparently decided that the fresh water in the lowest compartments of the ship should not be utilized for ship purposes, as the use of this water would tend to reduce the ship's stability. Owing to removal of some of the pipe lines, valves, etc., it was stated that it was not practicable to use the fresh water from these tanks and fill them with salt water, as no pumping and piping arrangements were installed to permit this exchange.

With regard to (*f*), it was inferred that the ship had not been turned over in satisfactory condition, which inference reflected on officers and men of the United States Navy. This matter was discussed with a captain of the Royal Navy, who was a passenger on the *Imperator;* he did not give this matter credence and considered it without foundation.

With regard to (*h*), such investigation as could be made indicated that these rumors were entirely without foundation.

Some of the foregoing points have been discussed with the naval architect of the Cunard Line, who informed me that the *Imperator* was now at Liverpool undergoing such alterations as were considered necessary to properly fit her for the trans-Atlantic trade. Some of the major alterations contemplated are as follows:

(A) It appears that the forced-draft blowers were removed, so far as being available for forced draft on the boilers, and were utilized as ventilation for bunkers and stokeholds. This accounts, in part, for the low speed obtained in this last voyage. These forced-draft blowers are to be reinstalled for use as originally intended.

(B) Additional ventilation, as necessary, will be fitted for bunkers and stokeholds.

(C) The necessary piping and pumping arrangements will be installed, so that fresh-water tanks can be flooded with salt water.

(D) Additional ballast will be added to improve the stability of the vessel.

As soon as overhaul and alterations are completed the vessel is to be inclined to determine whether she has a proper metacentric height for a vessel of this class; if not, additional ballast will be added as necessary.

PERISCOPE MANUFACTURE.

Source: Reliable.

9 December 1919.

(6490)

The firm of Sir Howard Grubb & Sons at Dublin, Ireland, has obtained possession of an old printing plant at St. Albans, England, where they have installed the necessary machinery to carry on some of their manufacturing work. The plant appears to be well equipped for the manufacture of optical instruments, although at the present time there is no pent house for use in connection with periscope inspection; it is therefore necessary, when making final inspection of periscopes, to set them up out of doors in a temporary scaffolding and when the weather is inclement it is difficult to make satisfactory final inspections.

The following items are of interest:

(*a*) The tubes for British instruments at this plant are being made entirely of bronze; the conical and reduced head sections of the tubes are nickel plated.

(*b*) It appears that the British have given up the use of steel for periscope tubing; this includes the special nickel-steel tubing that was extensively tried out during the war. This nickel-steel tubing did not prove satisfactory on account of corrosion and extensive pitting of the tubes. It appears that the process of manufacture of nickel-steel tubing has not been successful so far as periscope tubing is concerned. As sections of German nickel steel periscope tubing were available in Great Britain several years ago, it also appears that the British tube manufacturers have been unsuccessful in obtaining the same type of nickel-steel tubing for periscopes as is found in periscopes on German submarines.

(*c*) The question of cost of the nickel steel tubing is a question of controversy between the Admiralty and the contractors at the present time. It is understood that this tubing was made and furnished by Vickers to Grubb.

(*d*) A number of 36′ periscopes for the British K–Class were in the course of production. These periscopes are really 35′ long rather than 36′. The head section is very small, about $2\frac{1}{4}''$ in diameter, and the length of this head section is about $3\frac{1}{2}'$ to 4′. There are two types of these instruments under construction: one, with the main tube 6″ in diameter, the other with the main tube $7\frac{1}{2}''$ in diameter. It is understood that the optical characteristics of the 6″ tube are not particularly satisfactory owing to the great length of the tube and the relatively small diameter of the main section and the head section. The $7\frac{1}{2}''$ instruments look very cumbersome and heavy and will undoubtedly be difficult to satisfactorily install and control. It is understood that these instruments house well down to the keel of the boat; in fact, I was informed that it may be necessary to extend the housing well through the keel. This is not believed to be good practice. My impression of these instruments is to the general effect that they are too long, too heavy, and too cumbersome.

(*e*) A number of modifications, both optical and mechanical, have been made in their manufacturing practices as a result of the investigations made on German periscopes obtained from ex-German submarines. Some of these modifications will be apparent on the instruments being completed by this firm for the United States Navy. Other modifications will appear in later designs of British periscopes which are still in the production stage.

(*f*) The latest Grubb design of submarine periscopes is Mark XXVIII. The most important change appears to be in the breech

construction. Another change has been made by the elimination of the piano wire lens shift and the substitution therefor of steel rods operated by gear mechanism of the rack and pinion type which is assembled in the breech; this, in turn, is operated by a handle or knurled knob exterior to the breech. This mechanical feature of the lens shift appears to be superior to the wire rod and wire tape installation formerly made. In this connection it is understood that experiments were made with an electric lens shift, but the results were not sufficiently reliable to warrant proceeding with an installation of this character.

(*g*) From information obtained during this inspection it is considered that there are no points of superiority either mechanically or optically over the instruments now being produced in U. S. A. for sumbarines for the United States Navy.

(*h*) Inquiry was made relative to any developments underway with regard to range finding attachments to periscopes. So far as this contractor is concerned, there do not appear to be any developments along these lines which were not covered by inspection reports made by submarine officers of the United States Navy during the war.

MACHINE GUNS.

Source: Reliable.

16 February 1920.

A representative of the Bureau of Ordnance returned from the Springfield Arsenal on 10th February, at which point he witnessed a test of the modified Browning machine gun. The modifications intended for the purpose of strengthening the bottom plate of this gun appear to have been successful, but changes in the firing were not successful and the Army authorities consider that further experimentation will be necessary before they undertake the modification of any of these guns for issue.

This officer also visited Hartford, Conn., to see the development in the new 50-caliber machine gun. The Colt Arms Co. has been authorized by the Army to manufacture two 50-caliber machine guns which are to be an enlarged model of the standard Browning gun. One is to be an airplane gun and one is to be of the ground type. The ground-type gun has been completed and is ready for test, but work on this and on the airplane model is held up pending a decision of the Army as to the initial velocity they wish to obtain, as this velocity will decide the length of barrel necessary. As far as can be ascertained the Army has no present plan for putting these guns in production.

BRITISH LIGHT CRUISERS.

Source: Reliable.

13 January 1920.

(12602)

Name.	Yard building.	L.	B.	Depth.	D. tons.	Battery.	S. H. P.	SDK.
Enterprise..	J. Brown & Co..	565	54′ 5″	30′ 7″	6,000	7–6″	80,000	34
Emerald...	Armstrong-Whitworth.	565	54′ 5″	30′ 7″	6,000	7–6″	80,000	34

The *Enterprise*, which was launched in December, 1919, has four sets of Brown-Curtis geared turbines installed in two separate compartments and actuating four screws.

Each set of turbines consists of a high pressure and a low pressure ahead turbine, with an astern turbine incorporated in the exhaust casing of the low pressure ahead turbine.

This vessel with a displacement of 6,000 tons, has engines capable of developing 10,000 more S. H. P. than the *Lion* with a displacement of 26,350 tons.

AVIATION.

AIR DETACHMENT U. S. ATLANTIC FLEET.

16 February 1920.

Source: Reliable.

On Thursday, 22 January, two F–5–L's made a trip to Santa Cruz Del Sur, Guacanayabo Bay. On the return trip No. 3662 was forced to land with broken cam shaft gear, about 15 miles southwest of Pilon Harbor. Strong trades were blowing, velocity about 25 miles from the southeast, sea was rough with waves breaking, height of waves estimated at between 8 and 10 feet. Plane fairly heavily loaded, having on board six persons, 275 gallons of gasoline, 75-pound anchor and line, radio equipment, in addition to normal equipment. Owing to lack of power it was impossible to pick up a smoother spot between waves, and plane touched first of three heavy seas, hit rather heavily on crest of second wave, porpoised about 20 feet and landed rather heavily on the slope of the third sea. Landing was made directly into wind and sea. The V-bottom cushioned the shock splendidly, and plane completed landing without any damage to hull or wings. There is little doubt on the part of any of the crew of the machine that the hull and wings would have withstood a considerably harder landing without dam-

age. It is rather doubtful, however, if machine could have taken off with the load then on board. After landing, the machine rode the sea splendidly, shipping only occasional water through the front cockpit. Front cockpit cover was rigged immediately and except for heavy spray both kept completely dry. The starboard engine being disabled it was necessary in order reach Pilon Harbor to bring the wind on the starboard bow using the port engine only. The sea anchor was rigged to the first strut outboard of the engine strut and with the engine running at between 800 and 1,000 revolutions it was possible to taxi nearly in the desired direction without doing damage to the wing. After about an hour's taxiing the canvas tore out of the sea anchor. Because of the heavy sea it was extremely difficult to hold on the desired course, and impossible to do so without running the engine at about 1,200 revolutions. In making into port the fabric was torn on the left wing, and all ribs so badly injured as to require replacement. No damage was done other than to the left wing ribs.

In general, the behavior was excellent throughout, and had the starboard engine been available instead of port motor only there is no doubt that the machine could haye made port without mishap. The swells along this coast are extremely heavy owing to the constant trade winds, and judging from the behavior of this machine it is believed that an F–5–L could be counted on to land safely and remain afloat indefinitely under any normal sea conditions. Thorough examination of the structure showed that there had been, other than a slight slacking off of the starboard flying wires, no strain to strength members of the machine.

FRENCH AVIATION DURING WAR.

Source: Reliable.

14 January 1920.

(12616)

The following statistics are considered extremely interesting:

Number of Airplanes.

August, 1914. 21 squadrons of six planes each.
October, 1914. 65 squadrons of six planes each.
December, 1914. 70 squadrons of six planes each.
March, 1917. 189 Squadrons. 65 of the " Corps d'Armée " of 15 planes each.
34 " Heavy Artillery " of 10 planes each.
60 of " Chasse " of 15 planes each.
30 of "Bombardment " of 15 planes each.

There were, therefore, 2,665 planes in service and at the moment of the Armistice the programs called for 6,000. In 1914 the different squadrons were rarely complete.

Pilots.

August, 1914. 321.
January, 1915. 480.
January, 1916. 1,706 pilots, 680 observers, 7,980 mechanics.
January, 1917. 3,543 pilots, 1,187 observers, 12,518 mechanics.
September, 1917. 6,417 pilots, 1,682 observers, 17,461 mechanics.

In October, 1918, the Aviation personnel reached 75,105 in all, of which 12,219 were flying personnel.

The losses reached 61 per cent of the effective personnel. There is no combatant army of any of the belligerent countries that suffered so high a percentage of losses. These losses were composed as follows:

In the "Zone des Armees":	
Pilots and observers killed	1,645
Missing, of which death is certain	1,461
Wounded	2,922
Total	6,328
In the "Zone de l'Interieur":	
Pilots and observers	1,227
Grand total	7,555

In 1917, there were 1,410 deaths by accident and 829 in combat.

In the first six months of 1918, while the Infantry losses amounted to 51 per cent, those of aviation reached 71 per cent at the front alone: 16 per cent killed, 25.8 per cent wounded, 29.4 per cent missing (of which 75 per cent are dead); 116 pilots were killed in combat; 218 in accidents. (It is to be noted that only pilots are referred to.)

Expenses.

	Francs.
1914 (war period)	63,221,500
1915	268,614,000
1916	926,287,305
1917	1,342,263,630

Factories.

	Production of airplanes.	Number of workmen.
1914	.....	12,650
1915	3,460	30,960
1916	7,552	68,920
1917	22,751	131,551
1918	[1] 32,419	186,003

[1] Until Armistice.

Naval Aviation.

1914. (Mobilization), 8 seaplanes.

Armistice, 1,264 seaplanes, of which 370 were in actual service at the time of the armistice.

In 1914, no dirigibles.

In 1918, 56 dirigibles.

Kite Balloons.

18 November, 1918. There were 1,500 kite balloons.

British Aviation.

	August, 1914.	August, 1918.
Officers	285	30,000
Men	1,853	264,000
Airplanes	166	21,000
Seaplanes	45	1,300
Dirigibles	7	103

U. S. NAVAL AVIATION, GENERAL NOTES ON.

Source: Reliable.

26 January 1920.

The Aeromarine Co. has expressed an interest in securing planes of the H–16 or F–5–L type, for conversion into passenger-carrying machines, and are now seeking to make arrangements with the Navy Department to this end.

Very satisfactory results are being obtained in the tests of the new type S. E. 1345 ship's airplane radio set, which are being made on an Army JN–4H at Bolling Field. The tests with the General Electric Co.'s set have been completed and telephone signals were easily heard a distance of 33 miles. Partial tests of the Western Electric and Westinghouse sets show that to choose the best set out of the three samples submitted will be an extremely difficult task.

The approximate date of completion for each of the items for construction at Lakehurst for which allotment has been made, is as follows:

Hangar available for occupancy without power or heat, September, 1920.

Power plant and distributing system, April, 1921.

Roads, walks, grating, clearing, and permanent water supply and sewerage, April, 1921.

Officers' quarters, bachelor; civilian foremen's quarters; married officers' quarters, first three; blacksmith, pipe and filling shop, December, 1920.

The contract for alteration and extension of the dirigible hangar at Cape May, N. J., has been awarded. The hangar, when completed, will be 107 feet high in the clear, 114 feet wide, and 708 feet 6 inches long. The date of completion specified in the contract is 30 October, 1920.

The National Advisory Committee for Aeronautics at one of its meetings discussed the subject of aviation and aviation legislation. The two following resolutions were adopted:

First. That the Army and Navy should each have their independent services.

Second. That there should be created a body of some kind to control civil aviation.

The contemplated cruise of the *Shawmut* and *Sandpiper*, with six flying boats, includes touching at Haiti, Martinique, Trinidad, Venezuela, Curacao, Colombia, Canal Zone, Costa Rica, Nicaragua, and Grand Cayaman Island.

The name of the Joint Army and Navy Board on Aeronautics has been changed to the Aeronautical Board.

OPERATIONS.

FORMATION AND WORK OF THE COAST GUARD IN THE BRITISH ISLES.

Source: Reliable.

(318)

The Coast Guard was originally a customs force, but in 1856 it was taken over by the Admiralty and manned by active service ratings, who formed the first reserve for the fleet.

Between the time of naval ratings taking over the Coast Guard and the outbreak of war a very large number of additional duties was transferred to this branch of the Navy; wireless telegraphy was developed, the war-signal station system was formed, and stations were established at many points around the coast, and these necessitated a large proportion of the Coast Guard not being available for service afloat during mobilization and war. The war showed that the whole force was required for duty on shore and also that it is necessary to supplement this force during war time by volunteers or civil personnel.

The chief reason for inadequacy of the Coast Guard personnel during the war was due to increase of wireless telegraphy work, anti-submarine work, and the opening of additional war-signal stations. Further, while it was originally proposed that certain Coast Guard stations should be closed entirely during war time, it was found necessary to retain a large number of these as war-watching stations for linking up between war-signal stations. Further, it was found that coast guardsmen trained on shore can not be kept efficiently

ready for duties afloat; this is principally due to the rapid development of the present-day man-of-war. Further, it has been shown that the Coast Guard duties can generally be carried out by men of more mature age than that of ratings forming the reserve for the fleet.

From the above it was decided during the war to make some radical changes in the Coast Guard force and for this reason the present Pensioner Force was introduced. Under this system no ratings are accepted for the Coast Guard force until they have become pensioners, i. e., in the case of naval ratings have completed 22 years' service, and in the case of Marines 21 years' service. At the same time the Coast Guard force was thrown open to marines and now all branches, except artisans, sick berth ratings, victualing, and accountant branches, can volunteer for the Coast Guard force.

A rating on being accepted and joining the Coast Guard force serves for a maximum of five years—six years in the case of a marine—as Coast Guard. Thirty per cent of the Coast Guards become petty officers and two-thirds of the petty officers become chief officers, each step being served in for a maximum of five years with the exception of the marines in the lowest grade. The rates of pay of each grade are based on approximate civilian rates of pay and the pension is not taken into consideration. Each rank or rating, however, draws his pension concurrently with his Coast Guard rate of pay, and on his leaving the force receives a gratuity, the amount of which depends on his services in the Coast Guard force and the grade to which he has attained.

A very large number of the old Coast Guard force transferred to the new (Pensioner) force on its formation and no further ratings below pension age are being accepted. The old force is therefore moribund with the exception of wire telegraphy ratings.

In order to retain the services of a large number of active service telegraphist ratings who are redundant in the post-war fleet or would otherwise probably take their discharges, it has recently been decided to complete the number of telegraphists required for manning the wireless telegraph stations of Great Britain and Ireland.

Prior to the war no telegraphist ratings were allowed to enroll in the Coast Guard force, but when wireless telegraphy became one of the duties of the Coast Guard it was necessary to train the best personnel available for this work. A large number of the Coast Guards having served as signalmen afloat were trained in wireless telegraphy and formed the nucleus of the wireless section; it was found, however, that other ratings—stokers and seamen—who on entry to the Coast Guard force had no signal qualifications, were easily trained in this work and made very successful telegraphists.

The development of wireless telegraphy makes this system undesirable and it has now been decided that only wireless ratings shall form the wireless section of the Coast Guard and that only ratings who have served as signalmen afloat will form the signal section of the Coast Guard. The remainder of the Coast Guard is formed of all other ratings.

All ratings on entry to the Coast Guard force, except a wireless telegraphy or signal rating, undergo a short course of signals so that every Coast Guard man has some knowledge of this subject.

Coast Guard stations were originally selected for the execution of the customs duties and Board of Trade work (life-saving, etc.), and were therefore generally in the vicinity of some small port or harbor, or overlooking some bay, creek, or inlet where merchandise was loaded or unloaded or where smuggling could take place. Later, when signal stations became necessary, other Coast Guard stations were built on prominent headlands and other "points d'appui." Later, when wireless telegraphy was added to the duties carried out by the Coast Guard, it was decided in most cases for economy's sake to superimpose wireless telegraphy at war signal stations; for this reason, quite unnecessarily, many of the wireless telegraphy stations are situated in exposed, high, windy, and unsuitable positions. The sites of all later wireless telegraphy stations have been selected from a wireless telegraphy efficiency point of view as far as possible.

The following types of Coast Guard stations are met with in the United Kingdom:

(1) Coast Guard stations.
(2) Coast Guard and war signal or port war signal stations.
(3) Coast Guard stations with war signal stations or port war signal stations and wireless telegraphy stations.
(4) War signal stations or port war signal stations.
(5) Wireless telegraphy stations.
(6) D. F. stations.
(7) R. S. stations.

The general duties carried out at these stations are as follows:

(1) Coast Guard stations. These stations carry out work for the Board of Customs and Excise, Board of Trade, Post Office, Fishery Board, Lifeboat Institution, Meteorological Office, Trinity House and other Lighthouse Boards, Lloyd's and the Board of Agriculture; in addition to which they make certain reports to the Hydrographer and recruit for the Navy.

At stations under (2), in addition to the above duties, communication between the fleet and the Admiralty is maintained by visual signaling and the intelligence system of the British Isles is maintained.

At stations under (3), in addition to the duties at (1) and (2), communication between the fleet and Admiralty is maintained by wireless telegraphy.

Stations at (4) are visual links between the Admiralty and ships at sea, and in addition carry out intelligence duties, etc.

Stations at (5) form the wireless links between shore authorities and ships and between ships and ships.

Stations at (6) were erected during the war for plotting positions of aircraft and surface vessels, hostile and friendly. All these stations which are being retained now work independently and give wireless bearings only.

The stations at (7) are sound-ranging stations, and are used for the location of vessels and explosions by a system of microphones and ranging on the sound waves.

The general peace duties of the Coast Guard are as follows:

I. NAVAL.

(*a*) Communications between the fleet and Admiralty:

By wireless telegraphy and visual signaling through certain special stations.

(*b*) Intelligence:

All stations keep the Admiralty informed by telegraph of the arrivals, sailings, and movements of His Majesty's ships and foreign ships of war.

All stations inform the Admiralty of important occurrences on or near the coast that are not connected with the service.

(*c*) Recruiting:

Raise men and boys for the Navy.

Examine candidate for enrollment in the Royal Naval Reserve.

Interview pensioners as to fitness for the position they are detailed for on mobilization.

Verify addresses of Royal Naval Reserve men.

Give assistance in training Boy Scouts.

(*d*) Hydrographic:

Report to the Hydrographer of the Navy: All changes in the buoyage of ports, or in beacons erected on rocks, etc., for navigation, and when from any cause these become less conspicuous.

Erection of piers, etc., or conspicuous buildings likely to prove useful as aids to navigation.

Establishment, abolition, etc., of Coast Guard Stations, War Signal Stations, etc.

Abnormally high or low tides, with weather conditions prevailing at the time.

Any specially good landing places not mentioned in the sailing directions.

II. CUSTOMS AND EXCISE.

(*a*) Protection of Revenue:

Boarding of vessels and search for concealed dutiable goods. Clearing inward vessels in ballast. Searching fishing vessels and boats.

Watching the discharge of cargoes at places where customs officers are not stationed.

Patrolling the coast; visiting creeks and outlying landing places.

Collecting dues; issuing and receiving transires for coasting vessels.

Keeping arrival and sailing books; rendering shipping accounts.

In Ireland also—

Suppression of illicit distilling; responsible for coast, and islands within certain limits; assist constabulary in localities outside these special areas.

(*b*) Public health:

At boarding stations, ascertain whether ships from foreign ports are "infected" or "suspected," issuing certificates giving pratique or detaining vessels as required.

Provide boat for medical officer of health. Keep other ports informed as to sailings of infected or suspected vessels.

III. BOARD OF TRADE.

(*a*) Wreck and salvage:

Render every possible assistance to vessels in distress, and in event of shipwreck use utmost endeavors to save life.

Protect from plunder, etc., the vessel's rigging, spars, sails, stores, cargo, etc.

Keep watch on wrecked property left on beach.

Act as deputy receiver of wreck of certain places.

Keep receiver of wreck informed of all casualties; assist in taking depositions. Obtain statements from masters and others in cases of minor casualties.

Report fully to Board of Trade the circumstances of casualties occurring on or near coast.

(*b*) Life-saving apparatus:

Have, with few exceptions, charge of all rocket L. S. A. stations on coast of United Kingdom, and at every place where stationed render every possible assistance to local life-saving services.

Provide constant attendance at the coast communication telephones.

(*c*) Diseases of animals acts:

Arrange and superintend the burial of carcasses washed up or stranded. Prepare and render claims for services by civilians to receiver of wreck.

(*d*) Miscellaneous:

Keep constant watch for encroachments or acts of ownership upon any part of the shores of the sea and navigable rivers.

Assist in any matters connected with harbours, foreshore, and navigation.

Assist in enforcing the regulations for registrations of fishing vessels.

Report any infringement of the regulations as to carrying passengers by uncertificated vessels.

Look out for signals from lightships or lighthouses about wrecks, inform Royal National lifeboat authorities thereof, and put up notices for general information.

Enforce by-laws as to vessels carrying explosives.

Report changes in coast line to Association for Advance of Science.

Examine piers in Ireland annually and after storms and report.

IV. POST OFFICE.

Transact public telegraph business in remote places.

Render assistance to Post Office wireless telegraphy stations in maintenance of masts, rigging, etc.

Protect the shore ends of submarine telegraphs.

V.—FISHERY BOARD.

Collect statistical returns relating to quantity and value of fish landed.

Enforce the provisions of the sea fishery acts.

Report any depredations or encroachment by foreign fishing vessels which they are unable to prevent.

Detection of trawling within the 3-mile limit.

Display notices of warning to fishermen that H. M. ships are carrying out night firing in the vicinity.

Receive depositions made by persons who have sacrificed fishing gear in order to avoid damaging a submarine cable.

Render information respecting the mackerel and herring fishings.

Investigate all claims for damage to nets alleged to have been caused by H. M. ships; estimate damage, and give opinion as to genuineness of claim.

In Ireland also—

Watch for and report to conservators any infringements of the salmon fishing by-laws.

VI.—LIFEBOAT INSTITUTION.

Station officers serve as members of local lifeboat committees. Ratings may hold post as coxswain and form part of the crew of lifeboat.

Give immediate information to lifeboat authorities of all vessels observed to be in distress, and any information received from other sources.

Inform flanking lifeboat stations of any accident or other reason which may prevent a lifeboat from proceeding to render assistance to a vessel in distress.

NOTE.—These duties are also carried out with all other properly organized lifeboat services.

VII.—METEORLOGICAL.

Observe and render returns of air and sea temperature. Work storm-warning signals.

VIII.—TRINITY HOUSE AND OTHER LIGHTHOUSE BOARDS.

Report shifting of buoys, fallen beacons, light vessels drifting; any failure or irregularity in lights displayed.

Testing of electrical communication with lightships.

IX.—LLOYDS.

Commercial maritime signaling at certain stations.

Telegraphic reports of casualties by all stations.

X.—BOARD OF AGRICULTURE.

Enforce regulations as to landing of dogs.

Protection of wild birds.

The general war duties of the Coast Guard are, in addition to the peace duties, which are continued as far as possible, as follows:

I. Wireless telegraphy stations. These are divided into different classes:

(*a*) High power. Communications from Admiralty to fleet and from shore to shore.

(*b*) Medium power. Organized into groups for communication from shore to ship, from ship to shore. Work as independent stations from shore to shore. Further, they act as repair and construction works for shore wireless telegraphy stations' small gear, etc.

(*c*) Low power. Organizer into groups for fleet communications.

(*d*) D. F. stations. Giving bearings to ships when asked and obtaining and reporting bearings of hostile craft, etc.

In addition to the above, low power stations carry out communications between examination vessels and the local senior naval officer and also act as communication stations for lighthouses in connection with the lighting up, extinguishing of lights, etc.

II. War signal stations:

(*a*) Receive reports from passing vessels and forward them to the appropriate district intelligence office.

(*b*) Pass messages to ships.

(*c* Keep the appropriate district intelligence office informed of all occurrences.

(*d*) Pass all intelligence information to other war signal stations and such other authorities as are designated in the orders of the district intelligence office.

(*e*) Receive air-raid reports and pass them in accordance with the orders in force.

(*f*) Receive reports from war watching stations and deal with them in accordance with the orders in force.

(*g*) Certain stations are fitted for controlling mercantile traffic, and receive the necessary orders from their appropriate district intelligence office.

(*h*) Port war signal stations. Certain stations in the vicinity of defended ports are designated port war stations, and in addition to the duties enumerated in II (*a*) to (*g*) above, perform the following work:

(i) Identification of ships.

(ii) Reporting of ships wishing to enter the port, or passing by, to the local military authorities.

(iii) Establishing of communication with His Majesty's ships.

(iv) In certain cases the controlling of the examination service.

III. War watching stations:

(*a*) Patrol the coast and visit remote creeks, bays, etc., which are likely to be used by submarines.

(*b*) Keep a lookout for mines, passing submarines, etc.

(*c*) Take charge of mines washed ashore and render them safe.

(*d*) Report approach of hostile aircraft.

(*e*) Keep in touch with local military patrols, etc., and are cognizant of all occurrences on or near the coast.

(*f*) Report as necessary to the nearest war signal station.

ENGINEERING.

RADIO DIRECTION FINDING.

Source: National Navy.

(A translation.)

28 November 1919.

In a general way, the installation of a direction finding set on elevated ground gives rise to deviations of considerable magnitude, sometimes very irregular, at other times deviations subject to violent variations. We are giving here below the results obtained on three summits of about a hundred meters in elevation. Although the

tests carried out are not numerous, we think that they disclose certain general facts which it is important to point out, were it only for the purpose of future guidance.

Direction finder (radiogoniometre.—A square frame of 1 meter side; two flat coils of 6 turns each connected in parallel; pitch of winds, 1.5 cm.; distance between the two coils, 6 cm.; inductance, 75,000 cm.; direct reception on the tuning condenser; compensation by condenser.

Transmitter.—The transmitting set (poste emetteur) was placed on a vessel which described a certain number of circles around the direction finder. In the two first tests mentioned, the vessel was a trawler, the *Caille II* the set was a C. G. R. of 500 w. putting 6 to 8 amperes in the antenna. In the third test, the vessel was the tug *Vigoureux* equipped with a Tournier valve set with musical emission and also putting 6 to 8 amperes in the antenna.

TEST NO. I—SANGUINAIRE ISLANDS (CORSICA).

Location.—The direction finder was installed on a small elliptical plateau sufficiently level. All around the ground slopes at an angle of about 30° to 50°, but the descent in the directions northeast and southwest is limited to a few meters, the ridge of the island conserving an elevation nearly constant between the semaphore and the tower.

This ridge is very narrow. The southern slope is fairly regular, but the northern slope is of very jagged rocky formation.

Almost everywhere, the soil is made up of bare pebbles, except on the southern slope where, in the lower portions, there is a thin layer of mold with a vegetation consisting of very stunted underwood.

Distance maintained by the transmitter.—The *Caille II* described two circles. During the first she maintained a distance of 2.5 miles, during the second, a distance of 9 miles, from the direction finder.

Weather.—The weather was fine, but it had rained profusely on the 2d November and for the two circular turns of the 3d and 4th, the earth and even the rocks were still very damp.

Compensation.—The compensation was accurately accomplished; the tuning of the compensator was very sharp, but the tune changed very materially with the direction given to the transmitter.

The emissions made at a distance of 10 miles were completely extinguished; it was not so with those made at a distance of 2.5 miles, but in this case there was direct action of the wave on the amplifier, as a very appreciable sound was still heard on disconnecting all antennae.

The precision of the readings varied between 1 degree and one-quarter degree.

Deviations.—It was clearly quadrantal as on board ship with zero points corresponding to the direction of the axis of the island and to the two normals to the north and south slopes.

The slope of the curve was more accentuated for the zeros which corresponded to the normals to the axis than for the zero which corresponded to the axis itself.

The curves obtained on the 3d and 4th were separated by about 3°. It is possible that this was due to an error in the adjustment of the zero point of the graduated circle; on the 3d this zero was determined with a magnetic compass, the needle of which was sluggish.

Field of disturbance.—The curves of deviation give the rate of change of the variations in the field of disturbance in phase with the field of the wave.

Error at 180°.—In general it remains in the neighborhood of 3° with variations of 1° to 2° from one emission to the following one. The 4 November, on 450 m. it attained 10° to 12° between the 270 and 290, while for all the other azimuths it conserved the mean value of 3°. Its sign has always remained the same.

Irregularities.—At the azimuth of 311 the two readings on 450 m. were 330° and 116°, both extremely clear. They presented an error of 34° at 180° and gave a deviation of +2°, while the deviation deduced from the curve in this region is about 14°.

The reading 330 had been taken first. After the 116 readings we returned to the vicinity of 300°, with a view to verifying this extraordinary error. The emission ceased almost immediately, thus preventing us from obtaining an accurate reading, but the minimum was in the neighborhood of 300° and no longer in the vicinity of 330.

The interval elapsed between the reading 330 and that of 300 was at the most 30 seconds, the azimuth had not varied more than one-half degree.

We endeavored without success to refind this effect at the time of the next emission which took place at 316, whatever may have been the tuning of the condensers and the bad isolation introduced by touching different portions of the circuits.

We have also observed that, toward 253, the direction of the tower, during the silent periods, the sound would reappear very strong for very brief instants, without it being possible to find any cause so far as the instruments are concerned.

We consider that these anomalies are due to the field of the wave, influenced by the irregularities of the terrain.

TEST NO. 2.—AT ROUSSE ISLAND (CORSICA).

Location.—Passing via the north point, the hill has a practically conical form, the summit being at the semaphore itself. The slope varies between 20° and 25°. The soil is covered with a layer of

mold, sufficiently thick to permit the cultivation of wheat in certain places; in general it is covered with a vegetation consisting of low underbrush.

At the positions where the direction finder was set up, the terrain had a normal slope of from 20° to 25°. A telegraph line from the semaphore descends in a straight line in the direction 25°. It includes 4 wires.

Distance maintained by the transmitter.—The *Caille II* made two circular turns, on the 7 and 8 November, at distances of 6 and 4 miles.

Weather.—On the 6th there was a heavy rain and the soil was very damp during both tests. The wind was very strong and somewhat hampered the readings, on account of the noise and difficulty experienced in maintaining the frame oriented exactly toward the silent point.

Compensation.—The compensation was good, but perhaps a little less well defined than at the Sanguinaires. It is difficult to accurately decide concerning this point, as the violence of the wind hampered observation.

Deviations.—For the 600 m. wave the points arranged themselves rather regularly on a curve. For the emissions on 450 m. the deviations vary very much from one emission to the next and the full curve only represents the general form.

It was noticed that the deviations were very materially modified by the change in wave length; the maximum deviation is not the same in the two cases and the azimuth of the change of sign passes from 315 for 600 meters to 345 for 450 meters.

The deviation −2.5° for 285° will also be remarked. This deviation was observed on the emission from Stes. Maries de la Mer, and has been noticed on several occasions. It plots about 12° to one side of the curve obtained from the emissions of the *Caille* on 600 m.

Field of disturbance.—For the 600-meter wave, its variations followed fairly regularly the curve of the deviations; but, for 450 m. they were very irregular. The ratio of its amplitude to that of principal field attained 1/12 for 600 m. and about 1/6 for 450 meters.

Error at 180°.—In the tests of the 7th, position 1, this error has varied between 7° and 15°. In the tests of the 8th, it varied bebetween 0 and 7°. Its variations were rather irregular.

TEST NO. 3 AT GAROUPE.

(Near Antibes.)

This test is already rather ancient, but we join herewith its results to the preceding in order to bring out certain anomalies.

Location.—On the summit of La Garoupe there is a small plateau. It is practically level. On the azimuth 110° the terrain descends in a steep slope forming a plot of ground almost free of irregularities having a width of about 400 meters. Elsewhere the slope is very irregular. The soil is covered with mold almost to the summit; on the upper portion of the declivities there is a growth of underbrush. The direction finder (radiogoniometer) was set up at about 15 m. from the edge of the plateau.

Distance of the transmitter.—The *Vigoureux* made its turn at a distance of 3 miles.

Weather.—Had been very fine for several days, but the soil was not absolutely dry. The test took place at the beginning of May.

Compensation.—Perfect, extinction of sound very clearly defined; the readings were taken easily to one-quarter of a degree.

Deviations.—The number of observations was too limited to be able to appreciate the regularity of the deviations. Nevertheless, those relative to the emissions on 300 meters plotted very well in a regular curve.

It will be observed that the first change of sign occurs approximately in the direction of the line of greatest slope of the southeast declivity, and the second change approximately in the southwest direction of the axis of the plateau.

Toward the northeast direction of this axis, the deviations seem on the contrary to always continue to increase, but the form of the hill in the northerly direction is much less clearly defined than between the azimuth 40° and 220°.

Conclusion Resulting from Preceding Observations.

All possible precautions were taken during the preceding observations to avoid errors arising from the instruments. Particularly, the vessel remaining stationary, successive observations were taken by turning the direction-finding booth in all directions; the azimuth found was always the same to within about one-half degree.

With every assurances of certainty, therefore, we may attribute the deviations to the modifications of wave.

These modifications are due in general to distant or local causes, but in the experiments herein considered the local causes alone exist, or at all events greatly outweigh the others.

By local causes we mean, moreover, the disturbances which are produced at the very place where the direction finding apparatus is installed, disturbances due to the form of the terrain within a very limited radius. These are the most interesting, as they are the ones on which we may operate the most easily by moving the apparatus.

The tests above mentioned bring out the following general facts:

1. *The influence of the summit.*—On a summit the field due to an electromagnetic wave is considerably disturbed, the bearings will always be subject to important deviations. Precise compensation will be indispensable.

2. *The influence of the form of the terrain surrounding the summit.*—If the terrain descending from the summit toward the plain presents, in one direction, a smooth tract over a considerable extent (some hundreds of meters, perhaps even less) the line of greatest slope of this terrain is an azimuth of a change of sign of the deviation. In the neighborhood of this azimuth the variations of the deviation may be very rapid.

If the hill has a clearly defined elongated form, there is still a change of sign of the deviation in the direction of the greatest dimension. The deviation then assumes the quadrantal form as on board a ship.

3. *The influence of the irregularities in the terrain.*—If the terrain is very uneven on the slopes, important anomalies may be produced which are manifested by a brusk jump in the deviation or difficulty in obtaining the minimum values.

4. *The influence of the position of the apparatus on the summit.*—This position plays an important rôle; a displacement of some meters may occasion very considerable changes in the phenomena observed.

The direction finder having been moved some 20 meters, the deviations on 450 meters wave length become much more regular while at the same time changing as a whole from 2° to 3°. This fact might be attributed to the neighboring telegraph line. The time was lacking to make a test, after eliminating this line in the vicinity of the direction finder, but a theoretical investigation, which will form the object of a note in the near future, has shown us that the field of disturbance varies rapidly in the neighborhood of a summit or a crest and we are led to attribute the differences observed in test No. 2, to the displacement of the direction finder, aside from the existence of the telegraphic line.

GERMAN SUBMARINE LOW PRESSURE AIR COMPRESSOR.

Source: Reliable.

14 January 1920.

The blower in question was made by Messrs. Pokorney & Whittekind of Frankfort on Main, and the inspection plate states:

Capacity	90m3/min (3200 c.ft. per min.)
Pressure	.45 atm. (6.4 lbs. pressure.)
Speed	4800/5400 r.p.m.

From our investigation of the design of the machine it is clear that the volume and the pressure given are what would be attained when running at the highest speed, viz: 5,400 revs. per minute.

The outstanding features in the design of the machine are evidently that of lightness and the saving of space. For the latter reason the blower shaft is directly coupled to the motor, so that the whole machine has only two bearings, and this construction is new to British practice and would not be regarded as good for commercial machines, though justified for this special purpose.

The diffuser blades in the stator of the blower are castings. They are not curved and are roughly sharpened to a knife edge at the inner or entrance edges of the blades.

The practice of casting diffuser blades in is not good, because it entails an unnecessary reduction of area for the passage of air through the diffuser blades as compared with our own practice, which is to use light curved planished steel diffuser blades.

Our design, for example, when running at the same peripheral velocity, actually yields a delivery pressure 17 per cent higher than the German machine, other conditions being the same.

The construction of the cascade rings for sealing one compartment from the other against the leakage of air is from sheet brass riveted to brass castings, which construction, in our judgment, is not so satisfactory nor any cheaper than our method of employing white metal lined cascading rings.

The weight of the German machine is slightly less than a similar design of ours, but our design was prepared for commercial purposes, and it is considered that by the omission of the center bearings referred to earlier and the shortening of the machine thereby obtained, their weight would be realized.

A comparison of the two machines is given below:

	Pokorney & Wittekind.	Reavell & Co.
Revolutions per minute	5,400 maximum	5,000.
Capacity in cubic feet per minute	3,200	3,750.
Impeller diameter	25¼	24.
Delivery press	6.4 pounds	5.25 pounds.
Weight	12 cwts. 3 qrs.	18 cwts. 2 qrs.

It will be observed that when quoting the weights for the difference in the volumes above the variation in weight is not great.

ELECTRIC WELDING, TESTING OF.

Source: Reliable.

22 January, 1920.

(9638B)

In connection with the use of electric welding, particularly for shipbuilding, there has been developed an X-ray testing apparatus by which the quality of more important welds can be determined. This matter was discussed with an engineer of Cammell Laird's, who stated that X-ray testing apparatus was a practical proposition and would give considerable information relative to the quality of the weld. He further stated, however, that the application of this test to ordinary ship work was difficult, cumbersome, and in many cases impracticable. For a specific job the apparatus in its present state could not be satisfactorily used, but for general testing work it is not considered satisfactory.

Its use for specific jobs is the application of the apparatus on the X-ray photographic principle; resulting photographs indicate, in general, the nature of the weld, and show up particularly blow-holes, slag spots, and other indications of nonuniformity of the material. In other words, a very bad job of welding would be indicated by an application of the X-ray testing apparatus. However, no information would be given relative to the strength of the weld.

HORSEPOWER OF EX-GERMAN SUBMARINES.

Source: Reliable.

22 January, 1920.

There has been a good deal of discussion both here and in the United States relative to the name-plate data of engines installed in ex-German submarines. By some the name-plate data has been assumed to refer to I. H. P., while others maintain that it referred to B. H. P.

A good many tests have been made by the British on some of these ex-German submarine engines, and particularly on the engines installed in ex-German submarine U–135. This vessel is fitted with engines rated at 1,750 H. P. " name-plate data." These engines are of the six-cylinder design and are supposed to generate 300 H. P. each. Inforamtion available in the Admiralty, "Engineer in Chief's Department," shows that each cylinder is capable of developing 375 to 380 I. H. P. and 325 to 340 B. H. P. Eeven allowing a 10 per cent error in the indicator cards taken from these engines, it will be seen that each cylinder is capable of developing 300 B. H. P.

These results are of particular interest in view of the fact that a number of British authorities have been reluctant to admit that the name-plate data on these engines refers to B. H. P.

CONSTRUCTION AND REPAIR.

THE PROTECTION OF IRON WITH PAINT AGAINST ATMOSPHERIC CORROSION.

Source: Reliable.

5 January 1920

Mr. J. Newton Friend, D. Sc., Ph. D., F. I. C., publishes an article in the Iron and Steel Institute which contains considerable information of value relative to the painting of iron and steel.

This article reviews the various tests made and reports published by such authorities as Walker & Lewis, Walker & Voorheis, and Cushman & Gardner. It also refers to the extensive tests conducted at Atlantic City as well as similar tests carried out in Great Britain.

Some of the conclusions reached may be summarized as follows:

Relative Proportions of Pigment and Oil.

1. The best results may be expected from paints possessing as high a percentage of oil as is compatible with good body and with other working properties that have to be considered for the particular purpose in hand.

2. The greater the hunger manifested by the pigment the lower is the percentage of it required in the paint.

Coarse Versus Fine Pigment.

Evidently they should have a smaller diameter than the thickness of the coat of paint to be applied, otherwise they will project from the surface, rendering it more liable to mechanical injury.

In a well-ground pigment the particles may be expected to vary from 0.002 to 0.026 millimeter. In considering the advisability of reducing the size appreciably below this it is necessary to remember that:

(1) The finer the pigment the greater is the spreading power, and if this is increased beyond a certain limit the "body" or hiding efficiency becomes too weak for practical purposes.

(2) Beyond a certain working limit the cost of grinding a pigment to a still smaller size is increased out of all proportion to the reduction in size. It may be cheaper, therefore, to paint a steel structure twice with a good medium paint than once with a highly expensive mixture.

Sand Blasted Versus Scaled Plates.

In every case the appearance of the scaled plates was much superior to that of the sand-blasted ones, and the loss in weight due to corrosion is seen to be very much less.

Cheapest Method of Protection.

The presence of scale is usually regarded with suspicion, as tending to cause pitting during corrosion. This certainly is the case where the metal is completely immersed in water, since the liquid water is an excellent medium for promoting local activities of this kind. In the case of structures exposed to the air, however, pitting is hardly likely to occur to any serious extent, and certainly not to any greater extent than by allowing the plates to first rust in air without any paint in order to loosen the scale. Evidently, therefore, the cheapest method, and the one best calculated to prolong the life of the metal, is to paint structures while their scale is still on, after, of course, removing any loosely adherent flakes and rust. The coat of paint will last rather longer than it would if applied to the pickled or sand-blasted surface, and the labor and time involved in removing the scale are saved. When the coat of paint is worn out it should be scraped off, together with any loosened scale and rust, and the structure repainted again in the ordinary way.

The Painting or Rusty Surfaces.

Closely allied to the foregoing is the question of painting a rusty surface. In practice it is usual for the painter to carefully scrape away any rust prior to applying the paint. Undoubtedly it is essential to scrape away any hard lumps of rust or loose skin of magnetic oxide; theoretically, however, a slight coating of fine, uncaked rust might be an advantage rather than otherwise if a thin paint was applied. And this for two reasons:

1. Rust is practically a pure ocher. Hence, by applying a thin paint that contains a high percentage of oil, a similar result is obtained as by first cleaning the metal and then applying a coat of thicker paint.

2. If the rust is removed by scraping or with sandpaper a smooth, metallic surface remains which offers but little bite or grip for the paint. If, however, the rust is allowed to remain, the undersurface of metal is somewhat rough and the paint has an opportunity of adhering more closely.

Summary and Conclusions.

The following summary and conclusions refer to painted ironwork exposed to aerial corrosion:

1. The practical value of acceleration tests is shown to be very small in the present state of our knowledge. Reliable results can only be obtained from tests carried out under conditions closely resembling those required in practice.

2. Addition of pigment to oil increases the efficiency of the latter as a protective paint until a maximum is reached. After this, further addition of pigment causes deterioration. The best results are ob-

tainable from paints possessing as high a percentage of good oil as is compatible with good body and any other working property that has to be considered.

3. Linseed oil on setting expands by some 3.3 per cent. This is the primary cause of crinkling. Further oxidation causes a decrease in volume. This in time leads to cracking.

4. Linoxyn is permeable to moisture. The permeability is reduced by heating in absence of air, the oil increasing in density, viscosity, and molecular weight.

5. Polymerised linseed oil affords a better protection than raw oil when used as a paint vehicle.

6. The functions of a pigment are to toughen the film and render it less permeable to water vapor and oxygen. It also reduces the expansion of the oil on setting and thus minimizes the tendency to crinkle.

7. A thick coat of paint protects the underlying metal more efficiently than a thin coat, provided the coat is not so thick that running or crinkling takes place.

8. The very best results are obtained by multiple coats. Two thin coats are better than one thick one of equal weight.

9. Thinners enable thin coats of paint to be applied. Turpentine leaves a very slight residue behind upon evaporation, but its effect on the efficiency of the paint is small.

10. Other things being equal, the most permanent paints are those containing black or red pigments, since these absorb the shorter rays of light and prevent them from hastening the destructive oxidation of the linoxyn by the air.

11. Finer pigments afford more efficient protection than coarse pigments, since they are more thoroughly in contact with the oil.

12. Iron structures should be painted whilst their scale is still on after loosely adherent flakes and rust have been scraped off. The paint will last rather longer than if applied to the pickled or sand-blasted surface, and the labor of removing the scale is saved.

13. Experiments with rusty plates are not conclusive, but suggest that the rust need not be so carefully removed, prior to painting, as is usually thought to be necessary.

GENERAL INFORMATION, U. S. NAVY.

Source: Reliable.

31 January 1920.

Capital Ships.

The Navy program as of 31 January, 1920, showed 12 battleships authorized and contracted for, of which number 2 were launched, 4 were on ways, and the keels for 6 were not laid.

Steady progress was shown in the construction of the hulls for all battleships but the *West Virginia*, *Iowa*, and *Massachusetts*. The *West Virginia* remained the same as reported 31 December (27.0 per cent complete), while there has been no material reported fabricated as yet for the *Iowa* and *Massachusetts*. It will be noticed that the machinery for the *Colorado* and the *Washington* was reported 29.0 per cent complete 31 January as compared with the 1.4 per cent reported for a number of months previous. It is estimated that the *Maryland* will be launched during April, 1920.

Material for the six battle cruisers under contract is being received.

Scout Cruisers and Gunboats.

The program for scout cruisers had not changed any by 31 January, two being on ways and eight not yet laid down. Only slight progress, if any at all, was made in the construction of hulls, machinery, and armament for these vessels.

The program for gunboats also remained the same, one being launched and the other on ways.

Destroyers and Submarines.

The following table shows the current program on 31 January, 1920:

Type of vessel.	Authorized but not contracted for.	Total number under current contracts.	Completed.		Launched.	On ways	Keels not laid.
			Through January.	During January.			
Destroyers	12	269	164	4	63	35	7
Submarines	9	107	56	1	18	25	8

The January 31 forecast predicted the probable launching of 23 destroyers and 4 submarines during the ensuing three months.

The progress reported on engines for destroyers and submarines in most cases commensurate with the progress reported on the hulls. No progress was reported on the hulls for 31 destroyers and 11 submarines on account of the strike. Guns have been reported as 100 per cent complete for both destroyers and submarines, and broadside mounts were 100 per cent complete for destroyers.

Auxiliaries.

One Neff submarine and 1 transport were reported January 31 as authorized but not contracted for.

The following table shows a comparison as of January 31 and December 31 of other auxiliaries:

Type of vessel.	Under contract but uncompleted.								Completed during—	
	Total.		Launched.		On ways.		Keel not laid.			
	Jan. 31.	Dec. 31.	Jan. 31.	Dec. 31.	Jan. 31.	Dec. 31.	Jan. 31.	Dec. 31.	January.	December.
Submarine tenders	1	1	.....	.....	.....	.....	1	1	.....	.....
Destroyer tenders	2	2	.....	.....	1	1	1	1	.....	.....
Repair ships	1	1	.....	.....	1	.....	.....	1	.....	.....
Fuel ships	2	2	.....	.....	1	1	1	1	.....	.....
Ammunition ships	2	2	2	2	.....	.....	.....	.....	.....	.....
Oil tankers	6	7	1	2	5	5	.....	.....	1	.....
Mine sweepers	.....	1	.....	1	.....	.....	.....	.....	1	2

Small Craft. (Seagoing tugs, seaplane derricks, barges, harbor tugs.)

Of the nine seagoing tugs under contract, seven were launched and two were on ways 31 January.

The total program for seaplane derricks 31 January was three under contract but uncompleted (1 on ways, two keels not laid).

The program for barges was as follows:

	Under contract but uncompleted.	Launched.	On ways.	Keels not laid.	Completed during January.
Torpedo testing barges	1	1	.....	.....	.....
Oil and water barges	6	3	3	.....	1
Wood coal barges	7	.....	7	.....	.....

Aircraft.

Two harbor tugs were completed during January. Three had been launched by 31 January.

The total figures for the naval aircraft production since April, 1917, as reported 31 January, 1920, are shown in the following table:

	Total ordered.	Completed.	Incomplete.	Not recovered from abroad.	In service and on hand.
Service flying boats	[1] 1,604	1,602	2	200	795
School flying boats	340	340	.....	.....	180
School seaplanes	944	944	.....	.....	370
Experimental	53	29	[2] 24	.....	16
Land and shipboard airplanes	493	363	100	50	150
Foreign planes	38	36	2	.....	15
Kite balloons	380	377	3	50	140
Free balloons	22	22	.....	.....	21
Airships	49	41	8	.....	[3] 22
Total	3,893	3,754	139	300	1,709

[1] One F-5 supposed to have been built at NAF not completed.
[2] One D-9 canceled.
[3] Two airships thought to be unfit for use now judged to be serviceable.

Personnel.

The total personnel of the Navy, according to information on 31 January was 112,417, comprising 10,739 officers (9,437 permanent and temporary, 1,302 reserves) ; and 101,678 enlisted men (100,921 permanent and temporary, 757 reserves).

The total number of enlisted men, according to *file-room* figures, where an actual count is made of all new enlistments, discharges, etc., was 101,911. This made a total of 112,650 as the personnel of the Navy 31 January, according to file-room figures. However, the first figures may be accepted as approximately accurate owing to the fact that notices of new enlistments, etc., are often late in reaching the file rooms.

The Marine Corps personnel aggregated 16,629 on 31 January, of which number 1,163 were officers (1,156 permanent and temporary, 7 reserves), 15,466 enlisted men (15,368 permanent and temporary, 98 reserves).

NAVY DEPARTMENT,
BUREAU OF CONSTRUCTION AND REPAIR,
Washington, D. C., February 10, 1920.

Vessels under construction, United States Navy—Degree of completion, and probable dates of completion, as reported Jan. 31, 1920.

Type, number, and name.	Contractor.	Per cent of completion—				Contract date of completion.	Probable date of completion.
		Feb. 1, 1920.		Jan. 1, 1920.			
		Total.	On ship.	Total.	On ship.		
BATTLESHIPS.							
43, Tennessee	New York Navy Yard	98.1	95.1	96	92.3		May 1, 1920
44, California	Mare Island Navy Yard	88.9	82.8	87.2	80.7		Nov. 1, 1920
45, Colorado	New York Shipbuilding Corporation	42.2	25.9	40.2	23.3		Jan. —, 1922
46, Maryland	Newport News Ship Building & Dry Dock Co.	63	55.8	60	52 6		Jan. —, 1922
47, Washington	New York Shipbuilding Corporation	40.3	23.9	38.9	22.2		July —, 1922
48, West Virginia	Newport News Ship Building & Dry Dock Co.	27	5.8	27	4.2		
49, South Dakota	New York Navy Yard	7.1	.6	5.6	.4		
50, Indiana	do	7.1	.6	5.6	.4		
51, Montana	Mare Island Navy Yard	5	.5	3			
52, North Carolina [1]	Norfolk Navy Yard	5.3	.9	3.8	.3		
53, Iowa	Newport News Ship Building & Dry Dock Co.						
54, Massachusetts	Bethlehem Ship Building Corporation (Fore River).						
BATTLE CRUISERS.							
1, Lexington	Bethlehem Ship Building Corporation (Fore River).		(2)				
2, Constellation	Newport News Ship Building & Dry Dock Co.						

3, Saratoga	New York Shipbuilding Corporation	.1	.1				
4, Ranger	Newport News Ship Building & Dry Dock Co.						
5, Constitution	Philadelphia Navy Yard		(2)				
6, United States	do						
SCOUT CRUISERS.							
4	Todd Dry Dock & Construction Corporation.	34.3	12.8	34	11.5	Aug. 1, 1921	Dec. —, 1921
5	do	32.1	9.3	32.1	9.3	Dec. 1, 1921	Apr. —, 1922
6	do	26.3	2.2	24	2	July 1, 1922	Aug. —, 1922
7	Bethlehem Ship Building Corporation (Fore River).	3.9	2.1	3.5	1.8	Aug. 1, 1921	Aug. 1, 1921
8	do	3.9	2.1	3.5	1.8	Nov. 1, 1921	Nov. 1, 1921
9	Wm. Cramp & Sons Co	26		23			Aug. 1, 1921
10	do	25		22			Sept. 15, 1921
11	do	12		8		Oct. 1, 1921	Nov. 15, 1921
12	do	12		8		Jan. 1, 1922	Dec. 15, 1921
13	do	12		8		Apr. 1, 1922	Feb. 15, 1922
MISCELLANEOUS.							
Fuel Ship No. 17, Neches	Boston Navy Yard	55	50	48.3	41.7		Sept. —, 1920
Fuel Ship No. 18, Pecos	do	20.1	5.6	19.2	3.1		June —, 1921
Gunboat No. 21, Asheville	Charleston Navy Yard	97.4	95.9	94.5	92.5		Apr. 15, 1920
Gunboat No. 22	do	16	14	11.8	9.8		
Hospital Ship No. 1, Relief	Philadelphia Navy Yard	70.5	66.5	66.5	62.5		Sept. 1, 1920
Ammunition Ship No. 1, Pyro	Puget Sound Navy Yard	99.2	98	99	97.5		May 1, 1920
Ammunition Ship No. 2, Nitro	do	90	80	85	74		July 1, 1920
Repair Ship No. 1, Medusa	do	22	8	16			Feb. 25, 1921
Destroyer Tender No. 3, Dobbin.	Philadelphia Navy Yard	12	7.2	10	5.2		July 1, 1921
Destroyer Tender No. 4, Whitney.	Boston Navy Yard						
Submarine Tender No. 3, Holland.	Puget Sound Navy Yard						

[1] Keel laid Jan. 12, 1920.

[2] Material being received.

Vessels under construction, United States Navy—Degree of completion, and probable dates of completion, as reported Jan. 31, 1920—Continued.

Type, number, and name.	Contractor.	Per cent of completion—				Contract date of completion.	Probable date of completion.
		Feb. 1, 1920.		Jan. 1, 1920.			
		Total.	On ship.	Total.	On ship.		
MISCELLANEOUS VESSELS AUTHORIZED BUT NOT UNDER CONSTRUCTION OR CONTRACT.							
1. Transport No. 2							
OIL TANKERS.							
1652, Laramie	Wm. Cramp & Sons Co	97		88		Oct. 1, 1919	Mar. 1, 1920
1653, Mattole	do	80		75		Nov. 1, 1919	May 1, 1920
1657, Salinas	Newport News Ship Building & Dry Dock Co.	90		80		do	Mar. —, 1920
1658, Sapelo	do	(1)		90		Dec. 1, 1919	
1659, Sepulga	do	50		40		Jan. 1, 1920	May —, 1920
1660, Tippecanoe	do	40		30		Feb. 1, 1920	June —, 1920
1661, Trinity	do	30		20		Mar. 1, 1920	July —, 1920
FUEL OIL BARGES.							
20	Tank Shipbuilding Corporation	98		96		Aug. 11, 1919	Feb. 5, 1920
21	do	94		90		Sept. 5, 1919	Mar. 1, 1920
22	do	86		80		Sept. 30, 1919	Mar. 21, 1920
23	do	83		78		Oct. 25, 1919	Apr. 15, 1920
24	do	74		70		Nov. 19, 1919	May 7, 1920
31	Todd Shipyard's Corporation	(2)		95		Aug. 26, 1919	
32	do	94		89		Sept. 20, 1919	Feb. 25, 1920

DESTROYERS.							
71, Gwin	Seattle Construction & Dry Dock Co	98	98	97. 4	97. 4	Nov. 8, 1917	Feb. —, 1920
135, Tillman	Charleston Navy Yard	82	78	81	77		Sept. 30, 1920
179, Howard	Union Iron Works	(3)		98. 3	98. 3		
180, Stansbury	do	(4)		99. 3	99. 3		
187, Dahlgren	Newport News Shipbuilding & Dry Dock Co.	(5)		99			
188, Goldsborough	do	(6)		97			
189, Semmes	do	99		97			Feb. —, 1920
191, Mason	do	90		83			May 1, 1920
192, Graham	do	90		79			Do.
193, Abel P. Upshur	do	70		66			Aug. 1, 1920
194, Hunt	do	70		66			Do.
195, Welborn C. Wood	do	70		64			Do.
196, George E. Badger	do	70		64			Do.
197, Branch	do	80		73			July 1, 1920
198, Herndon	do	75		68			Aug. 1, 1920
199, Dallas	do	75		68			Do.
214, Tracy	Wm. Cramp & Sons Co	98		97			Feb. 14, 1920
215, Borie	do	96		91			Feb. 28, 1920
216, John D. Edwards	do	90		85			Mar. 10, 1920
217, Whipple	do	85		80			Mar. 20, 1920
218, Parrott	do	80		75			Mar. 30, 1920
219, Edsall	do	63		60			Apr. 20, 1920
220, MacLeish	do	75		67			May 10, 1920
221, Simpson	do	67		57			May 30, 1920
222, Bulmer	do	69		63			June 20, 1920
223, McCormick	do	66		60			July 10, 1920
224, Stewart	do	65		62			July 30, 1920
225, Pope	do	60		55			Aug. 20, 1920
226	do	58		54			Sept. 10, 1920
227	do	49		46			Sept. 30, 1920
228	do	48		44			Oct. 20, 1920
229	do	42		38			Nov. 10, 1920
230	do	39		37			Nov. 30, 1920

[1] Delivered Jan. 30, 1920.
[2] Delivered Jan. 24, 1920.
[3] Delivered Jan. 28, 1920.
[4] Delivered Jan. 8, 1920.
[5] Delivered Jan. 6, 1920.
[6] Delivered Jan. 26, 1920.

Vessels under construction, United States Navy—Degree of completion, and probable dates of completion, as reported Jan. 31, 1920—Continued.

Type, number, and name.	Contractor.	Per cent of completion—				Contract date of completion.	Probable date of completion.
		Feb. 1, 1920.		Jan. 1, 1920.			
		Total.	On ship.	Total.	On ship.		
DESTROYERS—continued.							
231, Hatfield	New York Shipbuilding Corporation	98		97			
232, Brooks	do	91.2		90			
233, Gilmer	do	96.2		95			
234, Fox	do	92.5		92			
235, Kane	do	88.2		86			
236, Humphreys	do	85		83.5			
237, McFarland	do	74.6		73.6			
238, James K. Paulding	do	71.4		69			
239, Overton	do	86.2		84.5			
240, Sturtevant	do	75.3		74.3			
241, Childs	do	67		65.3			
242, King	do	64.7		62.5			
243, Sands	do	77.4		77.2			
244, Williamson	do	79.5		79.3			
245, Reuben James	do	79.9		79.7			
246	do	56		54.3			
247	do	52.3		50.6			
248	do	53.3		50.8			
249	do	46.5		43.2			
250	do	47.8		44.4			
290, Dale	Bethlehem Shipbuilding Corporation (Squantum).	98.5	98.5	97	97		Feb. 5, 1920
291, Converse	do	96.5	96.5	93.5	92.5		Feb. 10, 1920
293, Billingsley	do	94.5	93.5	88	86		Feb. 20, 1920
294, Charles Ausburne	do	91	89.5	84.5	82		Mar. 1, 1920
295, Osborne	do	88	86	82	79		Mar. 10, 1920

297, Fuller	Bethlehem Shipbuilding Corporation (San Francisco).	97.7	95.4	95.6	93		Feb. 15, 1920
298, Percival	do	93.7	89.9	91.4	87.2		Feb. 28, 1920
299, John Francis Burnes	do	89.1	84.6	87.3	82.5		Mar. 15, 1920
300, Farragut	do	87.9	83.3	85.2	80		
301, Somers	do	83	78.1	82.4	76.8		
302, Stoddert	do	82.3	76.9	81	75.3		
303, Reno	do	80.6	74.5	79.2	73.1		
304, Farquhar	do	79.8	74	78.8	72.5		
305, Thompson	do	[1] 72.6	65	72.6	65		
306, Kennedy	do	[1] 72.1	64.5	72.1	64.5		
307, Paul Hamilton	do	[1] 72.2	64.6	72.2	64.6		
308, William Jones	do	[1] 72.3	64.6	72.3	64.6		
309, Woodbury	do	[1] 72.1	64.5	72.1	64.5		
310, S. P. Lee	do	[1] 73.6	66.2	73.6	66.2		
311, Nicholas	do	[1] 73.6	66.2	73.6	66.2		
312, Young	do	[1] 73.3	65.8	73.3	65.8		
313, Zeilin	do	[1] 73.3	65.9	73.3	65.9		
314, Yarborough	do	[1] 73.5	66.1	73.5	66.1		
315, LaVallette	do	[1] 73.8	66.5	73.8	66.5		
316, Sloat	do	[1] 73.5	65.8	73.5	65.8		
317, Wood	do	[1] 72	64.1	72	64.1		
318, Shirk	do	[1] 73.8	66.5	73.8	66.5		
319, Kidder	do	[1] 73.8	66.5	73.8	66.5		
320, Selfridge	do	[1] 73.7	66	73.7	66		
321, Marcus	do	[1] 73.1	65.3	73.1	65.3		
322, Mervine	do	[1] 73	65.3	73	65.3		
323, Chase	do	[1] 72.9	65.2	72.9	65.2		
324, Robert Smith	do	[1] 73	65.2	73	65.2		
325, Mullany	do	[1] 69.1	61.3	69.1	61.3		
326, Coghlan	do	[1] 66.6	58.7	66.6	58.7		
327, Preston	do	[1] 60.4	52.3	60.4	52.3		
328, Lamson	do	[1] 56.1	47.6	56.1	47.6		
329, Bruce	do	[1] 57.5	49.1	57.5	49.1		
330	do	[1] 34.3	22.9	34.3	22.9		
331	do	[1] 34.3	22.9	34.3	22.9		
332	do	[1] 34.3	22.9	34.3	22.9		
333	do	[1] 45.9	36.7	45.9	36.7		

[1] No progress as result of strike.

Vessels under construction, United States Navy—Degree of completion, and probable dates of completion, as reported Jan. 31, 1920—Continued.

Type, number, and name.	Contractor.	Per cent of completion—				Contract date of completion.	Probable date of completion.
		Feb. 1, 1920.		Jan. 1, 1920.			
		Total.	On ship.	Total.	On ship.		
DESTROYERS—continued.							
334	Bethlehem Shipbuilding Corporation (San Francisco).	[1] 34.3	22.9	34.3	22.9		
335	do	[1] 34.3	22.9	34.3	22.9		
336 Litchfield	Mare Island Navy Yard	87.3	86.9	81.2	80.7		Apr. 1, 1920
337 Zane	do	82.7	82.3	76.3	75.8		June 1, 1920
338 Wasmuth	do	66.6	65.1	60.5	58.7		Aug. 1, 1920
339 Trever	do	62.9	61.4	57.2	55.4		Oct. 1, 1920
340	do	39.1	36.1	37.1	33.7		Dec. 1, 1920
341	do	36.1	33.1	34.3	30.9		Jan. 1, 1921
342 Hulbert	Norfolk Navy Yard	89	87	86	83.5		May 1, 1920
343 Noa	do	89	87	86	83.5		June 1, 1920
344 William B. Preston	do	93.5	92.5	89.5	87.5		Mar. 1, 1920
345 Preble	Bath Iron Works	93.8	93.6	88.1	87.5		
346 Sicard	do	77.3	75.3	71.7	67.1		Apr. 5, 1920
347 Pruitt	do	65.7	60.4	57.9	51.9		June 14, 1920
DESTROYERS AUTHORIZED BUT NOT UNDER CONSTRUCTION OR CONTRACT.							
(12) Nos. 348 to 359, inclusive.							
SUBMARINES.							
52 AA–1	Electric Boat Co. (Quincy)	[2]	[2]	97.6	97.6	Mar. 19, 1918	
60 AA–2	do	96.1	96.1	96.1	96.1	Oct. 2, 1918	May 1, 1920
61 AA–3	do	96.3	96.3	96.3	96.3	Dec. 2, 1918	Apr. 1, 1920
105 S–1	do	97.5	97.5	97.5	97.5	May 8, 1919	
106 S–2	Lake Torpedo Boat Co. (Bridgeport)	99	99	99	99		Apr. 15, 1920

110 S–5	Portsmouth, N. H., Navy Yard	95.1	93.8	93.8	92.2	.....	Mar. —, 1920
111 S–6	do	90.1	88.7	89	87.5	.....	Apr. —, 1920
112 S–7	do	82.2	80.9	79.7	75.8	.....	May —, 1920
113 S–8	do	65.2	63.4	64.1	59.3	.....	Do.
114 S–9	do	56	50.7	55.8	49.1	.....	June —, 1920
115 S–10	do	38.9	33.1	37.5	31.2	.....	Aug. —, 1920
116 S–11	do	29.5	24	28	21	.....	Do.
117 S–12	do	26.8	21.6	26.7	19.1	.....	Sept. —, 1920
118 S–13	do	25.8	19	25.5	18.7	.....	Do.
119 S–14	Lake Torpedo Boat Co. (Bridgeport)	79.7	78.8	74.7	71.3	July 12, 1919	June 15, 1920
120 S–15	do	63.4	54	58.6	46.6	Aug. 12, 1919	Aug. 15, 1920
121 S–16	do	72.9	71.2	69.6	65.5	Sept. 12, 1919	July 15, 1920
122 S–17	do	59.7	47.4	58.1	45	Oct. 12, 1919	Sept. 15, 1920
123 S–18	Electric Boat Co. (Quincy)	93.2	93.2	92.6	92.1	Feb. 17, 1919	.....
124 S–19	do	92	91.5	91.5	90	Mar. 17, 1919	.....
125 S–20	do	91.5	90	91	88.5	do	.....
126 S–21	do	90.5	88	90	87	Apr. 17, 1919	.....
127 S–22	do	89.5	86.5	89	85.5	do	.....
128 S–23	do	89	85.5	88.5	84.7	May 17, 1919	.....
129 S–24	do	88	83.5	87.5	83	do	.....
130 S–25	do	87.5	82.5	87	82	June 17, 1919	.....
131 S–26	do	87	82	86.5	81.2	do	.....
132 S–27	do	84.5	79	83.5	77.5	do	.....
133 S–28	do	84	78	83	77	July 17, 1919	.....
134 S–29	do	83.5	77.5	83	77	do	.....
135 S–30	Electric Boat Co. (San Francisco)	[1] 92.1	91.4	92.1	91.4	Nov. 17, 1918	July 14, 1920
136 S–31	do	88.7	87.5	87.6	85.9	Dec. 17, 1918	Do.
137 S–32	do	[1] 87.2	85.7	87.2	85.7	do	.....
138 S–33	do	[1] 88.7	87.5	88.7	87.5	Jan. 17, 1919	.....
139 S–34	do	[1] 76.2	73.3	76.2	73.3	do	.....
140 S–35	do	[1] 73.7	67	73.7	67	do	.....
141 S–36	do	[1] 73.3	66.6	73.3	66.6	Feb. 17, 1919	.....
142 S–37	do	[1] 70.8	63.5	70.8	63.5	do	.....
143 S–38	do	[1] 71.1	63.9	71.1	63.9	do	.....
144 S–39	do	[1] 67.2	59.7	67.2	59.7	Mar. 17, 1919	.....
145 S–40	do	[1] 57	48.9	57	48.9	do	.....
146 S–41	do	[1] 55.7	45.9	55.7	45.9	do	.....

[1] No progress as result of strike.

[2] Delivered Jan. 30, 1920.

NOTE A.—Submarines authorized but not under construction or contract: Fleet submarines (9) Nos. 163 to 171; Neff submarine (1) No. 108.

Vessels under construction, United States Navy—Degree of completion, and probable dates of completion, as reported Jan. 31, 1920—Continued.

Type, number, and name.	Contractor.	Per cent of completion—				Contract date of completion.	Probable date of completion.
		Feb. 1, 1920.		Jan. 1, 1920.			
		Total.	On ship.	Total.	On ship.		
SUBMARINES—continued.							
153 S–42	Electric Boat Co. (Quincy)	3.8	.9	2.8	0.7	Dec. 30, 1920	
154 S–43	do	3.8	.9	2.8	.7	Jan. 30, 1921	
155 S–44	do	3.8	.9	2.8	.7	Feb. 28, 1921	
156 S–45	Electric Boat Co. (Quincy)	3.8	.9	2.8	.7	Mar. 30, 1921	
157 S–46	do	3.8	.9	2.8	.7	Apr. 30, 1921	
158 S–47	do	3.8	.9	2.8	.7	May 30, 1921	
159 S–48	Lake Torpedo Boat Co. (Bridgeport)	15	11.5			July 1, 1921	July 1, 1921
160 S–49	do	14.7	11			Aug. 1, 1921	Aug. 1, 1921
161 S–50	do	8.1	4			Sept. 1, 1921	Sept. 1, 1921
162 S–51	do	10.7	6.8			Oct. 1, 1921	Oct. 1, 1921
MINE SWEEPER.							
54 Willet	Philadelphia Navy Yard	(1)	(1)	93	92		
SEAGOING TUGS.							
26 Wandank	Ferguson S. & I. Corporation	99		96		June 30, 1919	Feb. 15, 1920
31 Koka	Puget Sound Navy Yard	98	97	95	93		Feb. 7, 1920
33 Pinola	do	99	99	97	95		Feb. 4, 1920
34 Algorma	Staten Island Shipbuilding Co., Port Richmond.	95		93		Apr. 12, 1919	Mar. 15, 1920
35 Carrabassett	do	89		87		Apr. 19, 1919	Apr. 7, 1920
36 Contocook	do	72		70		Apr. 26, 1919	May 1, 1920
37 Iuka	do	70		68		May 3, 1919	May 30, 1920
38 Keosanqua	do	66		60		May 10, 1919	June 1, 1920
39 Montcalm	do	58		53		May 17, 1919	June 30, 1920

[1] Completed Jan. 29, 1920.

OFFICE OF NAVAL INTELLIGENCE.
NAVY DEPARTMENT.
Washington, D. C.

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MONTHLY INFORMATION BULLETIN.

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FOR CONVENIENCE IN ROUTING.

Officer.	Initials.	Date received.	Date forwarded.
Captain			
Executive Officer			
First Lieutenant			
Navigating Officer			
Gunnery Officer			
Communication Officer			
Engineer Officer			
Medical Officer			
Supply Officer			
First Division Officer			
Second Division Officer			
Third Division Officer			
Fourth Division Officer			
Fifth Division Officer			
Marine Officer			

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MISCELLANEOUS.

STUDENT NAVAL ATTACHÉS.

Source: Reliable.

20 March, 1920.

The Office of Naval Intelligence and naval attachés are maintained out of the appropriation "Pay, Miscellaneous," as follows: "Cost of special instruction abroad, including maintenance of students and attachés * * * information from abroad and at home, and the collection and classification thereof."

At present there are no student attachés on account of the shortage of officers and the conditions resulting from the war. It is proposed at an early date to send several student attachés to China and Japan. In this connection a very valuable suggestion is made by Commander H. S. Babbitt, United States Navy, to the Director of Naval Intelligence, on the subject of a naval attaché at Constantinople, Turkey, viz:

Constantinople is the metropolis of the Near East, the meeting point (as possibly no other place) of East and West, and one of the great cities of the world. It is a converging point, probably to a greater extent than any other place, of both land and sea routes; and it has been such from the earliest times, and has been a meeting point for more various and more diverse races than any other city. In it are located the chief heads of the Greek, Orthodox, Armenian, and Jewish faiths; to all the various Balkan and Anatolian races and elements it has long been and remains "The City;" and its prestige seems to continue permanently tremendous, even among peoples such as the Hellenes and Roumanians, who have long been freed from its direct authority. This is recognized by all the European powers. There is a saying that "A diplomat has to do a tour in Stamboul before he really knows anything of diplomacy;" so far as practicable, most diplomatic aspirants are given a tour there sometime during their career; and only the most able are usually given the higher posts. Nearly all the important powers also have (or had before the war) both regular military and naval attachés (apart from the stationaire officers), together with assistants and a more or less elaborate office force. Specially qualified officers were chosen for these positions, and in many cases there were also officers, more or less closely associated with these missions, who had spent

practically their whole careers there. Meanwhile the United States has never had a regularly accredited naval attaché to Turkey; and the officer acting as such (the commanding officer of the *Scorpion*) was probably seldom very well fitted for this duty, and for reasons as indicated in the next paragraph.

The different elements and personalities at Constantinople are possibly the most diverse in the world. There are two different kinds of time, four or five different calendars, four or five different regular "languages of the country," with newspapers published in each, as well as in different European languages, and there are five or six major religious beliefs followed. Unlike in any other country, where one can somewhat "fall into the ways" and "get onto the general run of things" in two or three months, in Turkey it takes at least three years for the average foreigner to begin to really understand and actually know anything of what is, in fact, going on, and to appraise facts at their true value. There are many languages used. It takes a long time to become familiar enough with even two or three—which are absolutely necessary—to really always understand what is going on around one, and several are generally spoken at each and every mixed assembly, and often at the same time. Thus, besides the principal "languages of the country"—Turkish, Greek, and Armenian, English, French, German, and Spanish will also be heard in nearly every assemblage. One must have a good general knowledge of languages in order even to correct, coordinate, and properly interpret what is obtained by regular professional translators and interpreters. Even names—many intrinsically difficult enough—sometimes prove hopelessly confusing, unless the various spellings in different languages, etc., are understood. Thus, as an example, Réouf bey, French spelling, becomes Raouf bey in English; Konia, French, becomes Koniah in English, etc.

Sources of Information.

An immense amount of useful information could be obtained in Constantinople, for the reasons as indicated above; and it should also be noted in this connection, that nowhere else, probably, does one come into such close association with representatives of so many foreign navies. A properly equipped observer and good mixer could get a very good idea of the character and peculiarities of most of the world's navies in Constantinople alone. But the observer would have to be properly equipped, and this is considered the crux of the question. A great mass of information, much of it of great value, can also be obtained from the local newspapers, if consistently followed, translated, correlated, and interpreted. I myself learned this, much to my surprise, only after four years in Turkey, and then only through accident. This very incident is one of the impelling

motives of the present memorandum, and may be of value as indicating general conditions.

The Stamboul newspapers, of no matter what language, were previously considered entirely unreliable, and taken singly, or those of a single language taken singly, undoubtedly are so. But while interned on the *Scorpion*, a ship's news sheet was published on board from translations from all of the local newspapers published in French, Spanish, German, Greek, and occasionally Turkish, and from the Italian (published by Austrians in Trieste) and various German and Austrian papers which were allowed to come in as propaganda (there were three or four sailors on board able to make translations in each of the various languages). And to our surprise, when these articles from the various and such diverse sources as indicated were set in parallel, correlated, and considered together, it was found very excellent, and a more or less true presentation of the real facts in the matter could be easily deduced. And I may say that thereafter, though completely interned, we actually knew more of what was really going on than had been the case at any time during the previous four years, during which we had been completely free. Another very important source of information is from the numerous American business men in Turkey—tobacco buyers, oil men, etc. Many of these have been in Turkey for years, speak the local languages, and have spent much time in and are thoroughly acquainted with parts of the interior not ordinarily reached or well known. They all constantly come and go and pass through Constantinople, but to obtain their confidence or get anything from them the attaché must be a good mixer or have such on his staff. (Even this source of information was completely neglected most of the time until the war.) Turkish newspaper men—if one has some tact and has a general knowledge of facts and conditions to start with—are an excellent source of information, and particularly as to political affairs. They are all extremely anxious to cultivate foreigners (to "broaden" their outlook and to improve their proficiency in foreign languages), and if one has the patience to put up with them, will tell anything they know. (One of these, Ahmed Emin Bey, the official Government Turkish reporter who visited the eastern, Prussian, and western fronts several times for Enver Pasha, visited the *Scorpion* regularly once a month for about a year and a half, and always gave us a vivid picture of what he had seen. We also kept in touch with Caucasus and Dardanelles events through similar sources.) The Turk in general has a great "Amour propre," thinks all foreigners at heart against him (which they probably are), and is usually very reticent, but he "responds to kind treatment" better than any other national I have known, and, if so handled, any information or anything else wanted may be easily obtained. In this connection not simply tact

itself is sufficient, but conditions, customs, prejudices, tastes, etc., must also be known, in order not to wound his susceptibilities as to same.

Qualifications needed for Naval Attachés at Constantinople.

While it may not be necessary (though probably always desirable) that naval attachés at other capitals always should have any particular knowledge of languages, it is considered that in Constantinople this is absolutely necessary for an at all efficient performance of the duties, and this for the reason as indicated in paragraphs 2 and 3 above. The attaché should have a thorough knowledge and proficiency in French, as this is the recognized generally used medium in all the more serious diplomatic circles and generally in social gatherings. He should have an easy reading (at least) knowledge of German, on account of the great amount of technical matters in that language with which he will come in contact. He should also have at least some reading and speaking knowledge of Spanish and Greek, on account of the large elements of the population using these languages. These are considered fundamental. He should also have at least a slight knowledge of the simpler Turkish, numbers, etc., in order to get best results.

Specialization.

From the foregoing it will be seen that a considerable knowledge and proficiency in languages is considered necessary, and that several years are considered necessary to become familiar with and understand the complex conditions and elements in Constantinople. It is therefore believed that there should be a specialization for this place, similarly as in Japan and China. It is also considered much more necessary (because conditions and elements are much more complex) in Constantinople than anywhere else. (It should be noted in this connection that the Diplomatic and Consular Services have "student interpreters" in Turkey the same as in China and Japan.) It is believed specialization for naval attaché duty in Constantinople is more necessary than for that in any other place, and that three or four officers in connection with Office of Naval Intelligence should be more or less definitely assigned to this duty as a regular career (alternating in duty between Constantinople, the Office of Naval Intelligence, and the fleet), and that younger officers (of natural linguistic and other necessary qualifications) should be sent to the American stationaire at Constantinople (if it is retained there) with this definite object in view. Then, later, these younger officers could be sent back as assistant naval attachés, and eventually the naval attaché himself be chosen from among such previous assistant attachés.

Organization.

It is believed there should be a regular naval attaché, trained and qualified as indicated, and also an assistant, apart from officers of any stationaires or other vessels present, and that he should have at least two or three clerks. The latter are considered necessary on account of the great mass of translation, etc., necessary, and for reasons as indicated in paragraph (2). The naval attaché should also be accredited to all the Balkan States, and to such new States as may be formed from the Turkish Empire and Ukrainia, and travel to same be authorized. He should be required to visit each Balkan State and capital—Odessa, the Caucasus, Smyrna, Syria, and Egypt—at least once each year, in order to keep proper grasp and get all viewpoints on conditions, and so as not to become submerged in local affairs. For this reason a rather liberal travel allowance and extra compensation should be allowed. (The arrangements of the large American tobacco companies for their Near East and Turkey agents and buyers would be an excellent example and model for this.) While thus absent from the Constantinople headquarters, his senior assistant would direct the office. It is also contemplated his assistants should be the principal "mixers" in various circles, i. e., each cultivating particular circles, etc., and at the same time completing their language studies, studying up on near eastern questions, etc. Only studious, level-headed, and well-informed, tactful officers should under any circumstances be chosen for these details, of course.

It is probable Constantinople is still to continue to be the war storm center and "political whirlpool" of the world, as it has already been for several centuries—and possibly, for some time at least, to an even greater extent. It is therefore suggested that there should certainly be an expert "Near East" naval attaché, with headquarters at Constantinople, and it is believed formulation of plans should be undertaken now to assure same. It should also be borne in mind that Anatolia and the Caucasus regions have immense intrinsic mineral wealth. The oil fields of Roumania, the Caucasus, and Mesopotamia should be noted. Very good hard coal was discovered, during the war, at bottom of old Sinope mines. Once some kind of permanent and stable conditions are again established, even if only temporarily, there certainly will be a great economic and commercial development throughout all this region, and Constantinople will continue a center of great naval and maritime interest.

FRENCH NAVAL CONSTRUCTION.

Source: Translation of Chamber of Deputies Document.

GENTLEMEN: Before the war the French Navy occupied among the navies of the world a definite position corresponding to the exigencies of our national security and the pledges undertaken by France with reference to her allies.

The changes that have taken place in the equilibrium and in the respective power of the various nations necessitate a revision of the aims assigned to the national defense. They demand the readjustment of former means to the new political and financial needs resulting from the war and peace. Each country must make a thorough study of the consequence of this double event and in each country all the constituent elements of its greatness and its future must be submitted to the findings of this investigation. Decisions must be based on facts and not on theories.

This is the viewpoint that must guide us in determining the plan of action of our Navy, in disentangling from the mass of national and international problems the vital principle of the new mission which will be assigned to it.

The great influence exerted by the Navy on the development and outcome of the war will become more and more apparent as the close cooperation existing between the land and naval forces during hostilities becomes better known and confirms the fact that the Entente would have lost the war if it had lost mastery of the seas.

Without the cooperation of naval vessels and light craft which reduced the battle squadrons of the enemy to impotence, destroyed their raiders and won the submarine war, the blockade could not have been maintained, and the convoys that brought us grain, coal, iron and steel, and deposited millions of soldiers with their equipment on the soil of France, would never have been able to make the voyage, nor we to live and conquer.

The German and Austro-Hungarian fleets must be destroyed; the units composing them will be sunk, demolished, or divided among certain nations of the Entente, but it does not follow that this will terminate the rôle of the Navy. The gravest error that we could commit would be to believe that, the period of hostilities being ended and peace signed, some are in a position to renounce our naval power and postpone to a distant date the restoration or replacement of the units that are out of date or have been lost.

In the era opening before us, and as a primary consequence of the war, the seas are going to become the new theater of international activities and more than ever the gage of a nation's vitality. We must be in a position to utilize the possibilities created and multiplied by the war on the seas if we wish to derive from our victory and the

heavy sacrifices it cost us the legitimate advantages that result from it.

The desire for peace felt by all nations after the cataclysm which has just ravaged the world is not a sufficient guarantee against the unforeseen activities of the masses that defeat has temporarily left in an unsettled state nor against the reawakening of imperialism. Nor does it guarantee us against surprises that may be the outcome of the new international equilibrium, the regrouping and the revival of States and races.

Reason and interest both demand that the victorious nations guard the peace with forces capable of making it enduring. The seagoing squadrons are the surest support of foreign policy because they are always ready to act and can be moved rapidly to the point where their presence is needed. It is much easier to move a ship than it is to move a brigade or a division.

One need but enumerate the problems presented within the circumference of the seas to perceive the rôle that our Navy must play. The solution of these problems will be favorable or unfavorable to us, depending upon whether France shall follow a naval policy of action or of effacement. After having reappeared in the Baltic where tradition and our national interests were calling us and where we are witnessing the birth and the rebirth of nationalities which are going to be important factors in the recomposition of northern Europe, we can not furl our flag and look on with an indifferent eye while the old and the new nations are forming themselves into groups and making economic alliances that will prepare the way for political federations. We can not disregard the new oriental world looming upon the confines of Europe and of Asia and of which the Black Sea, that mute witness of the dawn and dissolution of so many great empires, threatens to become the center of polarization.

The difficulties that arose in the Adriatic at the time of the armistice and the part played by the British, French, Italian, and American naval forces in those waters furnish a sufficient example of the manner in which the Navy intervened in the peaceful settlement of the questions raised by the war.

Concentrated in the Mediterranean are the permanent necessities which exert the strongest influence over our national life. The western Mediterranean embraces all the lines of travel connecting the heart of France with North Africa. It is also the route which opens vast horizons to southern France, enabling it to communicate by way of Gibraltar with Atlantic Europe, the two Americas, and West Africa.

For centuries prior to the opening of the Suez Canal the eastern Mediterranean was a domain in which our Navy and merchant marine occupied a privileged position. French influence is still felt in this

region in the form of traditions, traces of its language, charitable institutions, schools, important works and services of all kinds rendered to civilization. Present events are of a nature to give a new birth to our commerce in this rich emporium of Asia if the prestige of our flag protects our interests there. The economic and political importance of this region is due to the fact that the eastern basin of the Mediterranean is one of the greatest thoroughfares of the world where the aspirations and interests of numerous peoples cross each other. By way of Suez and Djibouti it constitutes a maritime route leading to our possessions in the Indian Ocean and the Far East; by way of Mesopotamia it furnishes a land route from the coasts of Syria and Palestine to Persia; by way of the Dardanelles, it forms a Straits route cutting through at Constantinople the diagonal strip of land that connects Europe and Asia by rail.

The political map of this body of water in which prior to 1914 all the great nations of Europe were struggling to secure an important place for themselves has not been simplified. Some of these nations have disappeared, others have reappeared, and new ambitions have sprung up. The war has given added importance to the problems that had arisen in Asia and has stamped them with a more pronounced maritime character. The maintenance of peace requires that these problems be solved.

On the other hand it is inevitable that some interallied plan of naval action must result from the application of the treaty under the pressure of facts. We must be ready to take our part in it. It is, moreover, obvious that the navy built for France in the face of a Europe undergoing recomposition and of an Orient in a process of complete transformation will constitute a peaceful safeguard and the surest guaranty of our interests.

Sea power will be sine qua non for the preservation of the colonial empires. In order to preserve her colonial empire of 12,000,000 square kilometers and 50,000,000 souls, France must not only turn these possessions to account but must also watch over their safety, maintain their communications with Europe, make the nation visible and its power felt in all parts of the world where she is sovereign, and entrain as with the force of gravitation, her vast and far-distant territories in the rotation about her capital. Experience teaches that one retains only what one is able to organize and defend. Our colonial policy would be but a short-lived illusion unless it were based upon a sound naval policy.

France, the second colonial power of the world, does not possess at the present time an adequate maritime force for her overseas possessions.

If her colonial work in the nineteenth century represents what might be called the radio-activity of France, which, from Waterloo

to the Marne, developed steadily in spite of internal and external vicissitudes and fulfilled her civilizing mission in every part of the globe, her navy will be her incarnation in the twentieth century, destined to become the century of maritime empires in which the interests and aspirations of the races will clash. Nations who, fearing the stress and danger of the conflict, abandon the arena, will condemn themselves to decadence.

The world-embracing character of the war has already given birth to alliances and attractions between continent and continent. These new factors form the basis of an interoceanic policy that is going to control the naval policy of all the maritime powers. We see opening before us the rôle that France will be called upon to play in all the seas unless she evades the obligations laid upon her and the privileges conferred by her position on these seas.

The conflict that has destroyed the map of the Old World had produced a sort of contraction of the globe. It has diminished distances, brought continents closer together, increased the number and the complexity of interdependent nations, and brought governments face to face with conditions that can not be obviated and must be taken into account. They will benefit by all this if they know how to awaken the latent energies of the nations and are capable of estimating the political and economic dynamism of the sea. France must determine and define her naval policy with these new conditions in mind.

Either to be strong at sea or else surrender her place as a great nation. This is the dilemma that confronts the country, and these the reasons that have impelled the government to lay before you the present bill.

It has not failed to realize that this naval policy resulting from the war and the exigencies of victory, is also conditioned upon the budgetary needs and therefore submits for your consideration a program of expense restricted to the absolute necessities; but it will be sufficient for the period of expectation on which we are entering and which, while not engaging the future plainly shows the new directive forces that we must obey.

The composition of the national fleet is regulated by the law of 30 March, 1912, which fixes the number of vessels of all classes that are to be constructed and the conditions for renewing these units as they become obsolete or reach their limit of age.

It is not the purpose of the present bill to modify this organic law but to put into effect measures corresponding to present circumstances and immediately necessary, whatever may be the conditions that the great naval programs will later have to meet.

The law of 30 March, 1912, provides for the request for the annual credits needed for the execution of the work and for the necessary

equipment of the completed units. Among these credits should appear first of all the appropriations for the completion of the five dreadnaughts of the Normandy class, work on which was stopped in 1914.

In spite of the inferiority of this type of ship as compared with certain vessels laid down in foreign countries, some of which have even recently been placed in commission, these five battleships when completed would represent an increase in our naval strength. We must also bear in mind that France need not at the present time and under the prevailing condition of the world concern herself with the main body of her fleet. We must furthermore consider whether the completion of the five Normandies according to the original plans, or their transformation in conformity with new plans would provide the country with an increase in power commensurate with the cost of this work.

This question has been submitted to the Superior Council of the Navy and two solutions have been studied.

1. Complete the vessels with no change except those involved in increasing the range of the guns.

2. Lengthen the vessels to increase their speed, equip them with an antitorpedo caisson and increase the range of the guns.

The first solution would require an expenditure of more than 400,000,000 francs; the second, an expenditure of about 700,000,000 francs. In either case we should still have only out-of-date ships.

The decision of the Superior Council was that whether modified or not the Normandy ships should not be completed.

The program for light ships presents itself under a somewhat different aspect. It corresponds to permanent naval and political needs which the war has rendered still more pressing.

Even if the League of Nations should prescribe a limitation of armaments, no nation could fail to have itself represented abroad, to protect its overseas traffic, to defend its subjects and the security of its relations with its colonies by a means directly subordinate to the government, that is to say by its navy.

To employ ships of heavy tonnage for this purpose would be expensive, unnecessary and often impossible owing to the draft of such vessels. The light cruiser is the type par excellence for missions of this kind since it possesses a military character, power and speed, the most essential quality of all.

As in the case of light cruisers, we are also urgently in need of flotilla leaders. No matter how powerful a battle field may be, it would be paralized unless kept informed concerning the movements of the enemy and protected against torpedo attack.

Destroyer scouts are likewise capable of being employed in the most varied and useful ways because of their mobility and the force

they represent by their number. We do not possess a single one of such craft while the navies of other nations are abundantly supplied with them.

It should be possible for us to subdivide our naval forces sufficiently to be used simultaneously at various and far-distant points. This means that even if we can put off the construction of dreadnaughts, we are obliged to build light ships. From this point of view our Navy at the present time is in a very unacceptable position of inferiority as compared with other navies. This is because France is the only nation that was compelled absolutely to cease all work on the construction of new units during the war, all the forces of her arsenals and shipyards being devoted to the manufacture of the guns and munitions needed by the Army.

While our Allies have substituted modern units of superior type for the cruisers and destroyers that had become obsolete or were lost during the war, our light vessels, already partly out of date at the beginning of hostilities, have been subjected to so prolonged and severe a service that those that have survived no longer possess any military value.

We must remedy without delay a situation which, if allowed to continue, will cause us to lose our prestige and rank at sea and deprive us of some of the most precious fruits of victory.

The Superior Council of the Navy, at its meeting of 20 September, 1919, expressed the unanimous opinion that we should proceed with all haste with the construction of 6 light cruisers and 12 sea-going torpedo boats "considering that the French Navy is entirely lacking in light vessels of modern type which are indispensable to it."

The light cruisers and sea-going torpedo boats that we are proposing to construct correspond as regards their general arrangement, power, armor, and speed to the most recent progress in naval architecture and to the lessons taught by the war of 1914–1918.

Their characteristics are the following:

Cruisers.—5,200 tons; 30 knots; eight 14-centimeter guns, mounted in pairs, all on the longitudinal axis; 4 triple 550-millimeter torpedo tubes, two on each side; four 75-millimeter antiaircraft guns; three machine guns.

Scout-torpedo boats.—1,800 to 2,000 tons; 36 knots minimum; four 10-centimeter guns; three triple 550-millimeter torpedo tubes, all on the longitudinal axis.

We have the honor, therefore, to submit the following bill for your approval:

BILL.

The President of the French Republic decrees:

That the following bill be presented to the Chamber of Deputies by the Minister of Marine and the Minister of Finance who are charged with explaining its motives and conducting its discussion.

ARTICLE 1.

The construction of battleships Nos. 7, 8, 9, 10, and 11 (*Normandie, Languedoc, Flandre, Gascogne,* and *Bearn*), the laying down of which was authorized by the laws of 30 July, 1913, and 9 January, 1914, shall be stopped.

The Minister of Marine will take the necessary steps to annul existing contracts and to utilize material already received or constructed to the best interests of the state.

ARTICLE 2.

The six first-line scouts, the laying down of which was assigned in Appendix A of the law of 30 March, 1912, to the years 1917, 1918, and 1919 shall be laid down in 1920.

The Minister of Marine is likewise authorized to begin in 1920 the construction of 12 scout-torpedo boats.

MINERAL OIL CONCESSIONS AND RIGHTS, TOGETHER WITH OTHER DATA CONCERNING MINERAL OIL IN JAPAN.

Source: Reliable.

(11671.)

23 January, 1920.

The total area of the existing mining rights[1] for petroleum in Japan is said to be only about 10 per cent of the estimated total area of mineral oil deposits.

On 1 July, 1919, it was officially announced that the then existing mining areas (in Japan, excluding Hokkaido and Taiwan) totaled 139,717 acres, divided into 11,296 acres of mining lots (or 531 "mines") and 128,421 acres of prospecting lots (or 1,787 "mines").

Of these totals, the combined mining and prospecting lots of Niigata Prefecture showed the largest area, namely, 71,604 acres (or 1,404 "mines").

Akita Prefecture followed in importance, the area being 42,602 acres (or 624 "mines").

The two largest companies devoted solely to the mineral oil industry are the Nippon Sekiyu Kabaushiki Kaishi, and the Hoden Sekiyu Kabushiki Kaisha.

However, there are many other companies now in this field of activity, the statistics for which being, it is stated, as follows:

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[1] Employed in the sense of meaning registered mining (not inclusive of prospecting) rights only in this case.

Year.	Number of companies.	Capital.	
		Subscribed.	Paid up.
1916	34	$28,716,093	$20,598,269
1917	35	38,394,969	24,753,292
1918	39	50,147,106	31,438,177

Employees in this industry.

Year.	Under 15 years.		Under 20 years.		Over 20 years.		Total.	
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
1917	6		825	97	6,188	536	7,019	633
1918	9		885	129	6,481	559	7,375	688

Following are the particulars obtainable concerning names and addresses of principal concessionaires, with paid up capital in 1918 in each case:

Concessionaires.	Paid up capital.
1. Nippon Sakiyu Kabushki Kaisha, 1 Yuraku-cho 1-chome, Kojima-chiku, Tokyo	$12,462,500
2. Hoden Sekiyu Kabushiki Kaisha, Jonai-machi 1-chome, Nagaoka, Niigata-ken	8,100,625
3. Toyo Sekiyu Kabushiki Kaisha Kashiwazaki-machi, Niigata-ken	148,553
4. Kokura Tsunekichi, 2 Kobune-cho 2-chome, Nihonbashi-ku, Tokyo.	(Individual.)
5. Meiji Sekiyu Kabushiki Kaisha, Niitsu-machi Naka-Kambara-gori, Niigata-ken	398,800
6. Nakano Kogyo Kabushiki Kaisha, Kanatsu-mura, Naka-Kambara-gori, Niigata-ken	498,500
7. Taiyo Sekiyu Kabushiki Kaisha, 3 Uchisaiwai-cho 1-chome, Koji-machi-Ku, Tokyo	1,645,050
8. Dai Nippon Sekiyu Kogyo Kabushiki Kaisha, 31 Mitoshiro-cho 1-chome, Kanda-ku, Tokyo	934,688
9. Niigata Kogyo Kabushiki Kaisha, 18 Namiki-machi, Niigata, Niigata-ken	50,847
10. Chuo Sekiyu Kabushiki Kaisha, Niitsu-machi Naka-Kambara-gori, Niigata-ken	498,500
11. Suzuki Shoten, Shimo-Nakajima-cho, Nagaoka, Niigata-ken	53,340
12. Teikoku Sekiyu Kabushiki Kaisha, 1 Yuraku-cho 1-chome, Koji-machi-Ku, Tokyo	1,196,400
13. Shimpo Sekiyu Kabushiki Kaisha, 1 Karasumori-machi, Shiba-ku, Tokyo	124,625
14. Kuhara Kogyo Kabushiki Kaisha, 14 Nakano-shima 2-chome, Kita-ku, Osaka	20,563,125
15. Chugai Sekiyu & Asphalt Kabushiki Kaisha, Suyehiro-cho 2-chome, Kanda-ku, Tokyo	498,500
16. Nippon Asphlat Kogyo Kabushiki Kaisha, 7 Hachikan-cho, Kyobashi-ku, Tokyo	56,081

Following are the particulars obtainable concerning principal concessions, locations, etc., with names of holders, and the year of granting each concession:

1. Nishiyama oil field, Niigata Prefecture.

Holders: (*a*) Nippon Sekiyu Kabushiki Kaisha (1888); (*b*) Hoden Sekiyu Kabushiki Kaisha (1893); (*c*) Toyo Sekiyu Kabushiki Kaisha (1896); (*d*) Kokura Tsunekichi (1898); (*e*) Meiji Sekiyu Kabushiki Kaisha (1910); (*f*) Nakano Kogyo Kabushiki Kaisha (1914); (*g*) Taiyo Sekiyu Kabushiki Kaisha (1916); (*h*) Dai Nippon Sekiyu Kogyo Kabushiki Kaisha (1916).

2. Niitsu oil field, Niigata Prefecture.

Holders: (*a*) Nippon Sekiyu Kabushiki Kaisha (1893); (*b*) Hoden Sekiyu Kabushiki Kaisha (1893); (*c*) Niigata Kogyo Kabushiki Kaisha (1897); (*d*) Chuo Sekiyu Kabushiki Kaisha (1907); (*e*) Meiji Sekiyu Kabushiki Kaisha (1911) (*f*) Suzuki Shoten (1912); (*g*) Nakano Kogyo Kabushiki Kaisha (1914); (*h*) Dai Nippon Sekiyu Kogyo Kabushiki Kaisha (1916); (*i*) Teikoku Sekiyu Kabushiki Kaisha (1917).

3. Higashiyama oil field, Niigata Prefecture.

Holders: (*a*) Hoden Sekiyu Kabushiki Kaisha (1894); (*b*) Nippon Sekiyu Kabushiki Kaisha (1898); (*c*) Shimpo Sekiyu Kabushiki Kaisha (1911); (*d*) Dai Nippon Sekiyu Kogyo Kabushiki Kaisha (1916); (*e*) Teikoku Sekiyu Kabushiki Kaisha (1917).

4. Kubiki oil field, Niigata Prefecture. Holders: (*a*) Nippon Sekiyu Kabushik Kaisha (1895); (*b*) Hoden Sekiyu Kabushiki Kaisha (1898); (*c*) Dai Nippon Sekiyu Kogyo Kabushiki Kaisha (1916).

5. Nanukaichi oil field, Niigata Prefecture. Holders: (*a*) Nippon Sekiyu Kabushiki Kaisha (1892); (*b*) Hoden Sekiyu Kabushiki Kaisha (1898); (*c*) Nakano Kogyo Kabushiki Kaisha (1914); (*d*) Dai Nippon Sekiyu Kogyo Kabushiki Kaisha (1916).

6. Amase oil field, Niigata Prefecture. Holders: (*a*) Nippon Sekiyu Kabushiki Kaisha (1898); (*b*) Hoden Sekiyu Kabushiki Kaisha (1899); (*c*) Kokura Tsune-Kichi (1901); (*d*) Chuo Sekiyu Kabushiki Kaisha (1907); (*e*) Taiyo Sekiyu Kabushiki Kaisha (1916).

7. Ojiya oil field, Niigata Prefecture. Holders: (*a*) Nippon Sekiyu Kabushiki Kaisha (1888); (*b*) Hoden Sekiyu Kabushiki Kaisha (1893); (*c*) Nakano Kogyo Kabushiki Kaisha (1914); (*d*) Kuhara Kogyo Kabushiki Kaisha (1912).

8. Kurokawa oil field, Akita Prefecture. Holders: (*a*) Nippon Sekiyu Kabushiki Kaisha (1896); (*b*) Dai Nippon Sekiyu Kogyo Kabushiki Kaisha (1917); (*c*) Hoden Sekiyu Kabushiki Kaisha (1918).

9. Toyokawa oil field, Akita Prefecture. Holders: (*a*) Nippon Sekiyu Kabushiki Kaisha (1898); (*b*) Hoden Sekiyu Kabushiki Kaisha (1899); (*c*) Kokura Tsune-kichi (1903); (*d*) Chugai Sekiyu & Asphalt Kabushiki Kaisha (1907); (*e*) Nippon Asphalt Kogyo Kabushiki Kaisha (1912).

10. Ishikari oil field, Hokkaido Prefecture. Holders: (*a*) Nippon Sekiyu Kabushik Kaisha (1904).

11. Yufutsu oil field, Hokkaido Prefecture. Holders: (*a*) Hoden Sekiyu Kabushiki Kaisha (1905); (*b*) Dai Nippon Sekiyu Kogyo Kabushiki Kaisha (1917).

12. Sagara oil fields, Shizuoka Prefecture. Holders: (*a*) Nippon Sekiyu Kabushiki Kaisha (1905); (*b*) Hoden Sekiyu Kabushiki Kaisha (1905).

13. Byoritsu oil field, Taiwan Prefecture. Holder: Hoden Sekiyu Kabushiki Kaisha (1904).

A mining concession or "area" in the sense employed in the mining laws of Japan is a space the boundaries of which are determined by straight surface lines descending perpendicularly, from 5,000 tsubo (about 4 acres) upward in extent for all minerals except coal, mining areas for which are from 50,000 tsubo (about 42 acres) upward.

The maximum is 1,000,000 tsubo (about 826 acres). However, for the protection of mining interests, or for the division or combination of areas, the limit of 1,000,000 tsubo may be exceeded.

Only Japanese subjects, or concerns incorporated under Japanese laws, are entitled to acquire mining rights.

Provided the concessionaire begins operations within one year from the date of registration of a mining right, unless there is a valid reason for a longer delay; provided that operations are not suspended voluntarily by the concessionaire for a period of a year or more, except by and through a valid reason; and provided that the mining operations are conducted in accordance with the scheme of work submitted to the Minister of Agriculture and Commerce, who is the competent cabinet minister (Art. XL of the mining laws now in force), there is no set time limit to the duration of a mining right conducted in good faith.

Particulars, as far as obtainable, concerning the principal mineral oil companies of Japan, are as follows:

1. *Nippon Sekiyu Kabushiki Kaisha.*—Established 1888; subscribed capital, $19,940,000; paid-up capital, $12,462,500; head office, 1 Yuraku-cho 1-chome, Kojimachiku, Tokyo; president, Kyukan Naito; managing director, Jiro Tanaka; directors, Tatsutaro Yamaguchi, Hidesaburo Kusumi, Otohiko Matsukata; refineries, Kashiwazaki Machi, Niigata-ken; Tsuchiza, Akita-ken; Kuroi, Niigata-ken; Karukawa, Hokkaido.

Principal wells.

Name.	Location.	Name.	Location.
Rumoye	Hokkaido.	Kurokawa	Niigata.
Ishikari	Hokkaido.	Nagamine	Niigata.
Kurokawa	Akita.	Takeishi	Niigata.
Katsurane	Akita.	Gamoo	Niigata.
Urayama	Akita.	Gochi	Niigata.
Asahikawa	Akita.	Matsushiro	Niigata.
Abukawa	Akita.	Kukuno	Niigata.
Tsukigi	Akita.	Matsunoyama	Niigata.
Toyoiwa	Akita.	Itakura	Niigata.
Yatsuhashi	Akita.	Hachizaki	Niigata.
Nishiyama	Niigata.	Tsukioka	Niigata.
Niitsu	Niigata.	Mizunoki	Niigata.
Omo	Niigata.	Urase	Niigata.
Maki	Niigata.	Nanukaichi	Niigata.
Kakizaki	Niigata.	Yoita	Niigata.
Kaji	Niigata.	Ominto	Niigata.
Iwata	Niigata.	Murono	Niigata.
Sagara	Shizuoka.	Niita	Shizuoka.

Production of important wells belonging to this company:

Name.	1918		1917	
	Quantity.	Value.	Quantity.	Value.
	Gallons.		*Gallons.*	
Kurokawa	23,680,966	$3,021,983	29,809,686	$1,649,475
Nishiyama	12,485,719	2,233,280	15,299,947	1,597,835
Niitsu	1,482,771	235,747	1,736,309	153,104
Uruyama	1,225,229	144,182	1,726,444	81,203
Omo	879,569	141,681	2,240,908	203,224
Urase	913,739	140,499	1,014,106	89,740
Maki	577,324	108,098	588,190	68,046
Nanukaichi	342,468	53,013	307,870	27,888
Ishikari	253,443	48,675	258,685	25,157
Asahikawa	361,388	46,119	388,886	24,895

Total production of the company:

	Gallons.	Dollars.
1918	45,601,508	6,708,170
1917	56,632,384	4,214,219

Under date of 25 December, 1919, it was reported that the Nippon Sekiyu Kabushiki Kaisha had purchased the Chuo Sekiyu Kabushiki Kaisha for $2,741,750, and that the latter company was to be dissolved about 10 January, 1920.

The Nippon Sekiyu Kabushiki Kaisha has charge of the working of some of the Japanese Navy Department oil fields in Ako, Taiwan.

Work commenced at Kosenbo last October and will continue for two years.

2. *Hoden Sekiyu Kabushiki Kaisha.*—Established 1893; subscribed capital, $9,970,000; paid-up capital, $8,100,625; head office, Jonai-machi 1-chome, Nagaoka, Niigata-ken; president, Keizaburo Hashimoto; managing director, Kinezo Fukushima; directors, Tokichi Watanabe, Kanichi Nakano; Sataro Kawakami, Tokujiro Kagitomi, Shintaro Chashi; refineries, Shimo-Nakajima, Nagaoka, Niigata-ken; Kashiwazaki Machi, Niigata-ken; Niitsu Machi, Niigata-ken; Nuttari Machi, Niigata-ken; Sekiya, Niigata City, Niigata-ken.

Principal wells.

Name.	Location.	Name.	Location.
Michikawa	Akita.	Rengeji	Niigata.
Niitsu	Niigata.	Ishiji	Niigata.
Nishiyama	Niigata.	Koda	Niigata.
Higashiyama	Niigata.	Yashiroda	Niigata.
Maki	Niigata.	Chuyei	Niigata.
Kanatsu	Niigata.	Torikoye	Niigata.
Amase	Niigata.	Kurokawa	Niigata.
Betsusan	Niigata.	Kokunidani	Niigata.
Mishimadani	Niigata.	Kamakura	Niigata.
Shokawa	Niigata.	Sagara	Shizuoka.
Tamugisan	Niigata.	Byoritsu	Taiwan.
Sugawa	Niigata.	Sugayama	Shizuoka.
Myohoji	Niigata.		

Production of important wells belonging to this company:

Name.	1918		1917	
	Quantity.	Value.	Quantity.	Value.
	Gallons.		*Gallons.*	
Niitsu	20,468,701	$3,244,215	23,961,050	$2,216,167
Nishiyama	7,567,979	1,333,657	11,010,097	1,170,944
Higashiyama	5,741,645	828,520	6,430,964	531,661
Maki	464,280	86,925	599,390	69,341
Michikawa	519,230	61,098	181,671	.....

Total production of the company (excluding Taiwan):

	Gallons.	Dollars.
1918	35,141,189	5,674,047
1917	42,954,510	4,090,491

It is reliably reported that the Hoden Sekiyu Kabushiki Kaisha has recently purchased the Chugai Sekiyu (petroleum) and Asphalt Kabushiki Kaisha. The Hoden is reported to have also purchased the Akita Mineral Oils Manufacturing Co., a small concern principally devoted to refining.

The Hoden also has charge of the working of some of the Japanese Navy Department oil fields in Ako, Taiwan.

Work commenced last October at Nairyo and will continue for two years.

3. *Dai Nippon Sekiyu Kogyo Kabushiki Kaisha.*—Established 1916; subscribed capital, $3,738,750; paid up capital, $934,688; head office, 31 Mitoshiro-cho i-chome, Kanda-Ku, Tokyo; president and managing director, Chiaki Hirose; directors, Ichinosuke Shimizu, Kozu Coto, Torajiro Okumura, Yahei Uyeda, Shohei Okada, Motojiro Shiraishi.

Principal wells.

Name.	Location.
Yokoyama	Niigata.
Asahi	Niigata.
Hire	Niigata.
Nadachi	Niigata.
Gimei	Niigata.
Nishiyama	Niigata.
Kanatsu	Niigata.
Higashijima	Niigata.
Torikoye	Niigata.
Higashiyama	Niigata.
Niitsu	Niigata.
Sodayama	Niigata.
Muyamoto	Niigata.
Maki	Niigata.
Kokuni	Niigata.
Ochiai	Akita.
Toyokawa	Akita.
Michikawa	Akita.
Furioi	Hokkaido.

4. *Nakano Kogyo Kabushiki Kaisha.*—Established, 1914; subscribed capital, $498,500; paid-up capital, $498,500; head office, Kanatsu-mura, Naka-kambara-gori Niigata-ken; president, Kanichi Nakano; managing director Chutaro Nakano; director, Shingo Nakano.

Principal wells.

Name.	Location.
Kanatsu	Niigata.
Kurokawa	Niigata.
Kanayama	Niigata.
Otani	Niigata.
Higashijima	Niigata.
Karamegi	Niigata.
Kamiyuwai	Niigata.
Niita	Niigata.
Ashiaraiba	Niigata.

5. *Chuo Sekiyu Kabushiki Kaisha.*—Established, 1907; subscribed capital, $498,500; paid-up capital, $498,500; head office, Niitsu-machi Naka-Kambara-gori, Niigata-ken; president, Kanichi Nakano; managing directors, Shingo Nakano and Masuro Otsuka.

Principal wells.

Name.	Location.
Asahi	Niigata.
Yashiroda	Niigata.
Okino	Niigata.

It is reported that this company was recently purchased by the Nippon Sekiyu Kabushiki Kaisha.

6. *Chugai Sekiyu & Asphalt Kabushiki Kaisha.*—Established, 1907; subscribed capital, $747,750; paid-up capital, $498,500; head office, 1 Yayesu-cho 1-chome, Kojimachi-ku, Tokyo; president, Hirokazu Minagawa; managing director, Yujiro Shimizu; directors, Kinzuburo Kada, Takichi Hashimoto, Tokichi Watanabe, and Inosuke Seshima.

Principal well.—Name, Chugai-Toyokawa; location, Akita.

It is reported that this company is now controlled by the Hoden Sekiyu Kabushiki Kaisha.

7. Established, 1916; subscribed capital, $1,645,050; paid-up capital, $1,645,050; head office, 3 Uchisaiwai-cho 1-chome, Kojimachi-ku, Tokyo; president, Shoichi Hasegawa; managing directors, Kenkichi Yamamoto, and Shinsuke Tsunekawa; directors, Seiji Tsuji and Yukio Kawakata.

Principal wells.

Name.	Location.
Nishikoye	Niigata.
Nishiyama	Niigata.

8. *Teikoku Sekiyu Kabushiki Kaisha.*—Established, 1917; subscribed capital, $2,991,000; paid-up capital, $1,196,400; head office, 1 Yuraku-cho 1-chome, Kojimachi-ku, Tokyo; president, Kenichi Fujita; managing director, Yasushi Oka; directors, Yeizo Nagasaki, Tamenosuke Ishibashi, Bokushin Oi, Rin Miyao, and Peitaro Ikumo.

Principal wells.

Name.	Location.
Hoppo	Niigata.
Kamakura	Niigata.
Nugata	Niigata.
Takezawa	Niigata.

9. *Kokura Tsunekichi (individual).*—Established, 1898; head office, 2 Kobune-cho 2-choe, Nihonbashi-ku, Tokyo.

Principal wells.

Name.	Location.
Kokura-Toyokawa	Akita.
Koguchi	Niigata.
Kamada	Niigata.
Nitta	Niigata.

10. *Meiji Sekiyu Kabushiki Kaisha.*—Established, 1910.—subscribed capital, $398,-800; paid-up capital, $398,800; head office, Niitsu Machi, Naka-Kambara-gori, Niigata-ken; president, Shizuo Sakai; managing director, Tatsujiro Fujii; directors, Okuzo Shiota and Sutejiro Takagi.

Principal wells.

Name.	Location.
Karamegi	Niigata.
Haguro	Niigata.
Nishiyama	Niigata.

11. *Toyo Sekiyu Kabushiki Kaisha.*—Established, 1896; subscribed capital, $249,250; paid-up capital, $148,533; head office, Kashiwazaki Machi, Niigata-ken; president, Shinsuke Hachio; managing director, Shintaro Hachio; directors, Yoshihide Saito and Taro Nakano.

Principal wells.

Name.	Location.
Shiidani	Niigata.
Sakata	Niigata.

12. *Shinpo Sekiyu Kabushiki Kaisha.*—Established, 1911; subscribed capital, $498,500; paid-up capital, $124,625; head office, 1 Karasumori-machi, Shiba-ku, Tokyo; president, Takenori Takano; managing director, Saburo Nakamura; director, Hyogo Senba.

Principal well.—Name, Urase; location, Niigata.

13. *Nippo Sekiyu Kabushiki Kaisha.*—Established 1910; subscribed capital, $498,-500; paid-up capital, $311,563; head office, 19 Honzaimoku-cho, Nihonbashi-ku, Tokyo; president, Suketaro Kawasaki; directors, Hidejiro Tsuchiya, Koshichi Fukui, Kenzo Aoji, and Seizo Tanaka.

Principal well.—Name, Takahama; location, Niigata.

14. *Kuhara Kogyo Kabushiki Kaisha.*—Established 1912; subscribed capital, $37,-387,500; paid-up capital, $20,563,125; head office, 14 Nakanoshima 2-chome, Kita-ku, Osaka; president, Fusanosuke Kuhara; managing directors, Korehiko Takeuchi and Setsutaro Nakayama; directors, Kosuke Saito and Chozo Koike.

Principal well.—Name, Aratani; location, Niigata.

15. *Nippon Asphalt Kogyo Kabushiki Kaisha.*—Established 1910; subscribed capital, $74,775; paid-up capital, $56,081; head office, 7 Hachikan-cho, Kyobashi-ku, Tokyo; president, Koshichi Natanabe; managing director, Hikosuke Komura; directors, Kanji Nagaya, Toyokichi Yashida, and Unokichi Mayeda.

Principal well.—Name, Tsukigi; location, Akita.

16. *Niigata Kogyo Kabushiki Kaisha.*—Established 1896; subscribed capital, $997,-000; paid-up capital, $50,847; head office, 18 Namiki-machi, Niigata, Niigata-ken; managing directors, Matsuzo Aoyama and Sukeshichi Takahashi; directors, Saizo Arakawa and Yohachi Sugata.

Principal wells.

Name.	Location.
Nikkoji	Niigata.
Taya	Niigata.
Kurokawa	Niigata.

17. *Suzuki & Co.*—Established 1911; capital, $53,340; head office, 64 Shimonakajima-cho, Nagaoka, Niigata-ken; representative partner, Seizo Suzuki.

Principal well.—Name, Koguchi; location, Niigata.

18. *Dewa Sekiyu Kabushiki Kaisha.*—Established 1917; subscribed capital, $1,495,500; paid capital, $373,875; head office, 1 Yuraku-cho 1-chome, Kojimachi-ku, Tokyo; president, Kenichi Fujita; managing director, Yasushi Oka; director, Yeizo Nagasaki.

19. *Hakko Sekiyu Kabushiki Kaisha.*—Established 1909; subscribed capital, $149,550; paid-up capital, $149,550; head office, Taya, Nittsu-machi, Niigata-ken; directors, Seiichiro Kobayashi, Toshi Sakamoto, and Yoshitami Sakamoto.

These two companies have not yet obtained concessions, although they are said to have several prospecting areas in Yamagata Prefecture.

20. *Shin-Nippon Sekiyu Kabushiki Kaisha.*—Established 1916; subscribed capital, $124,625; paid-up capital, $124,625; head office, 15 Minami-Nabe-cho 2-chome, Kyobashi-ku, Tokyo; representative director, Motojiro Shiraishi; directors, Kaijiro Kondo, Tokichi Watanabe, and Rokuro Watanabe.

21. *Kita-Nippon Sekiyu Kabushiki Kaisha.*—Established 1914; subscribed capital, $62,313; paid-up capital, $62,313; head office, 1 Yayesu-cho 1-chome, Kojimachi-ku, Tokyo; managing director, Sotaro Yamaguchi; directors, Masatoshi Watanabe and Han Ando.

At present these two companies are said to have only one or two prospecting areas in Aomori Prefecture.

Production.

The oil deposits in Japan are mostly in the Tertiary sediments along the Japan Sea, in central Hokkaido, and in Taiwan. Generally speaking, the main productive formations are said to be comparatively thin, so that the life of a well is usually rather short under existing conditions.

However, with present endeavors toward deep-well boring (with American-type cable and rotary drills), and a closer study of water tables in the various oil districts, it is expected that not only will the present average output of about 5 koku (238.29 gallons) per well per day be increased, but that the average life of a well will be lengthened.

Present wells are said to average from 1,490 to 2,980 feet in depth.

The drilling of well, and other operations of this industry, are mostly done by American-type machinery made in Japan.

The average cost of drilling a well about 3,000 feet deep in the Nishiyama oil field, for example, is stated to be about $2,800 to $3,300, including fuel, wages, and supplies, exclusive of casings.

Production costs are relatively high, due to increased wages and price of materials. It is estimated that it probably costs from 30 to 45 cents per koku (47.657 gallons) to produce petroleum at present.

As a rule, Japanese oil beds are not hard, so that this cost of production seems rather high.

The crude petroleum produced is somewhat heavier than the American variety.

The largest production center of Japan for mineral oils is Niigata Prefecture. In 1917 the quantity of petroleum there produced was 77,521,758 gallons, valued at $7,223,482.

In 1918 production in Niigata had fallen to 61,846,459 gallons. However, owing to enhanced valuations noticeable in every commodity, the 1918 output was valued at $10,160,152.

Next to Niigata in importance comes Akita Prefecture with a production of 41,675,809 gallons in 1917, valued at $2,213,211. The production dropped to 39,817,496 gallons in 1918, but the valuation rose to $4,923,530.

Other centers of production of petroleum are: Ishikari, Kitami, and Iburi Prefectures in Hokkaido, and the two Prefectures of Yamagata and Shizuoka, in Honshu (the main island).

The total production of petroleum in Japan (excluding Taiwan) is as follows:

Year.	Quantity.	Value.
	Gallons.	
1915	122, 169, 690	$4, 921, 896
1916	123, 558, 416	7, 475, 852
1917	119, 576, 223	9, 473, 469
1918	102, 110, 650	15, 162, 923

Up to the end of September, 1919, the estimated production of petroleum was 67,737,796 gallons. The value, therefore, is not given in any estimates as yet.

However, the general tendency of decrease in production and increase in valuation will probably be observable when complete figures for 1919 are available.

The somewhat noticeable failure to maintain production has been attributed to the inability to secure enough oil-well material, particularly casings from America, during 1918, owing to embargoes placed on material necessary for war use.

Another reason, it is stated, is the too close spacing of wells in every concession.

Of late the demand for oils and greases (due to more extensive use of machinery) has shown a tendency to increase. At the same time domestic production has decreased, as evidenced by the 122,169,000 gallons of petroleum produced in Japan (exclusive of Taiwan) in 1915, as compared with the 102,110,650 gallons produced in 1918.

In addition, exports of mineral oils have considerably increased (principally to Kwantung Province and Asiatic Russia), while imports have not, in the main, been noticeably affected since 1915.

In consequence, there seems to be a temporary shortage of mineral oils in Japan, which accounts, in a measure, for the noticeable increase in the values thereof for 1918.

Particulars as to exports and imports are as follows:

Exports of kerosene and other mineral oil.

KEROSENE OIL.

	1917		1918	
	Quantity.	Value.	Quantity.	Value.
	Gallons.		*Gallons.*	
China	2,438,082	$602,886	841,669	$274,508
Kwantung	1,151,189	290,586	658,926	228,621
All other countries	4,753	1,294	155,283	28,472
Total	3,594,024	894,766	1,655,878	531,601

Total gallons from January to September, 1919, 390,860; valued at $177,225.

OTHER MINERAL OIL.

	1915		1916	
	Quantity.	Value.	Quantity.	Value.
	Gallons.		*Gallons.*	
China	3,806,579	$70,204	31,799,236	$896,005
Kwantung	4,074,768	95,782	14,672,987	474,205
Hongkong	88,608	2,300	3,141,608	63,605
Asiatic Russia	17,988	368	2,308	151
Total	7,987,943	168,654	46,616,139	1,433,966

	1917		1918	
	Quantity.	Value.	Quantity.	Value.
	Gallons.		*Gallons.*	
China	5,997,984	$198,800	3,156,908	$207,715
Kwantung	7,936,313	413,184	8,540,560	704,649
Hongkong	100,732	6,970	10,415	921
Asiatic Russia	465,780	37,503	2,690,397	316,237
Total	14,500,809	656,457	14,398,280	1,229,622

Total gallons from January to September, 1919, 17,021,375; valued at $1,381,596.

Imports of crude petroleum, kerosene, and all other mineral oil products.

CRUDE MINERAL OIL.

	1915		1916	
	Quantity.	Value.	Quantity.	Value.
	Gallons.		*Gallons.*	
Dutch India				
United States	4,765,592	$356,347	2,739,390	$204,838
Total	4,765,592	356,347	2,739,390	204,838

	1917		1918	
	Quantity.	Value.	Quantity.	Value.
	Gallons.		*Gallons.*	
Dutch India			143,283	$8,571
United States	3,242,766	$248,534	1,127,825	95,081
Total	3,242,766	248,534	1,271,108	103,652

Total gallons from January to September, 1919, 1,202,680; valued at $149,002.

PETROLEUM PRODUCTS—BENZINE.

	1915		1916	
	Quantity.	Value.	Quantity.	Value.
	Gallons.		*Gallons.*	
Dutch India	579,077	$125,562	561,214	$123,498
United States	498,034	89,222	142,206	30,361
Total	1,077,111	215,784	703,420	153,859

	1917		1918	
	Quantity.	Value.	Quantity.	Value.
	Gallons.		*Gallons.*	
Dutch India	345,512	$90,617	2,404,460	$112,239
United States	383,594	106,163	321,339	109,957
Total	729,106	196,780	2,725,799	222,196

Total gallons from January to September, 1919, 1,293,457; valued at $673,590.

Imports of crude petroleum, kerosene, and all other mineral oil products—Continued.

KEROSENE OIL IN CANS.

	1915		1916	
	Quantity.	Value.	Quantity.	Value.
	Gallons.		*Gallons.*	
Dutch India	539,321	$78,343	5,400	$668
United States	15,860,355	2,101,235	9,642,771	1,293,846
Total	16,399,676	2,179,578	9,648,171	1,294,514

	1917		1918	
	Quantity.	Value.	Quantity.	Value.
	Gallons.		*Gallons.*	
Dutch India	452,915	$66,114	399,705	$72,025
United States	7,317,532	1,067,081	9,257,099	2,015,509
Total	7,770,447	1,133,195	9,656,804	2,087,534

Total gallons from January to September, 1919, 5,375,554; valued at $1,950,635.

KEROSENE OIL IN BULK.

	1915		1916	
	Quantity.	Value.	Quantity.	Value.
	Gallons.		*Gallons.*	
Dutch India	6,636,479	$803,128	2,439,027	$292,375
United States	11,323,283	1,236,425	10,186,534	1,190,223
Total	17,959,762	2,039,553	12,625,561	1,482,598

	1917		1918	
	Quantity.	Value.	Quantity.	Value.
	Gallons.		*Gallons.*	
Dutch India	1,029,876	$133,583	3,113,664	$499,860
United States	10,626,325	1,377,701	10,495,848	1,667,027
Total	11,656,201	1,511,284	13,609,512	2,166,887

Total gallons from January to September, 1919, 19,596,123; valued at $5,154,297.

BRITISH AND JAPANESE TRANSOCEANIC TONNAGE.

Source: Reliable.

1 March, 1920.

Ships Which Could Be Used for Troop Transport.

Practically all transoceanic passenger ships are over 4,000 gross tons and of 14 knots or over.

The following figures on Great Britain are taken from Commerce Reports of 1 March, 1920, which figures were compiled from Lloyd's Register for 1919. These ocean steamers are of over 4,000 tons gross, divided as to speed down to and including 14 knots.

GREAT BRITAIN.

	Number.	Gross tonnage.
20 knots and over	7	154,576
19 to 20 knots	2	18,718
18 to 19 knots	20	270,345
17 to 18 knots	33	428,491
16 to 17 knots	41	347,766
15 to 16 knots	62	547,889
14 to 15 knots	126	1,010,762
Total	291	1,778,547

The following table gives the Japanese ocean tonnage figures on the same basis as the British and from the same source:

JAPAN.

	Number.	Gross tonnage.
20 knots and over	2	26,437
19 to 20 knots		
18 to 19 knots	2	25,060
17 to 18 knots		
16 to 17 knots	2	10,975
15 to 16 knots	11	88,403
14 to 15 knots	10	64,268
Total	27	213,143

It has been estimated that to transport a division of 20,000 men complete in every respect, with heavy gear, including horses, land transport, etc., there are required approximately 150,000 gross tons of shipping. This means an average of 7.5 gross tons per man. Therefore, from the above table, Great Britain could transport 370,473 men with complete equipage.

Japan, on the above basis, could transport 28,419 men with complete equipage.

In the "Japan Financial and Economic Annual, 1919," the following statistics are given regarding Japanese ships over 4,000 gross tons and having a speed of 14 knots or more, on 1 January, 1918:

Number of ships	63
Tonnage	458,229

It will be noted that there is a discrepancy between the Japanese figures taken from two different sources.

DECK PLANKING ON H. M. S. "RENOWN"—UNUSUAL METHOD OF INSTALLATION.

Source: Reliable.

(12755.)

14 February, 1920.

In connection with refitting H. M. S. *Renown* for the contemplated visit to the colonies of H. R. H. The Prince of Wales it was necessary to expeditiously make a number of alterations on this vessel in order to satisfactorily accommodate the royal party.

The upper decks of this vessel were left bare and some form of asbestos insulation installed under the steel decks to prevent sweating. As bare steel decks were not considered suitable for the royal party, the installation of the ordinary teak decking was authorized. In a completed vessel of this size and type, the amount of work involved, especially the cutting and fitting to install this deck by normal methods, would require a great deal of time, which was not available. It was therefore decided to adopt the following method:

Bolts were welded to the steel deck by the quasi-arc welding process; the deck planking was fitted over the tops of the bolts, the securing nuts and grommets being fitted after the planking had been installed over the bolts. This required slightly larger holes in the planking, but the work was proceeded with, and the results to date are apparantly quite satisfactory.

After the bolts had been welded to the deck, each one was tested to determine whether a reasonably satisfactory weld had been made. This test was conducted by means of lightly hammering the bolts.

A special holding tool or clamp was utilized to hold the bolts perfectly upright during the welding process; otherwise, no special appliances were required.

As this method of procedure permitted rapid completion of the job, and as the water-tight integrity of the steel deck was in no way interfered with, it appears that similar procedure might be satisfactorily followed in some classes of naval work.

CONDITION OF AMERICAN MINES PICKED UP ON NORWEGIAN COAST.

Source: Reliable.

(6794–A.)

3 March, 1920.

The Norwegian naval attaché in London, Capt. S. Scott-Hansen, has been kind enough to collect and give to the United States naval attaché, London, the following information concerning American mines which were salved on the Norwegian coast during the war:

The first American mines were found on the west coast of Norway in June, 1918.

The length of anchor wire attached to the mines has often been more than 100 meters. Some have had a piece of wire 10 to 20 meters long and others none.

It was difficult from the appearance of the rupture to judge whether the wires had been cut. Some of the mines having quite a short bit of wire may possibly have been cut loose, else it is supposed that the majority have broken away from their moorings.

The lengths of the copper antenna accompanying the mines differed very much. Only a few had a full length one with float (1 or 2).

A great quantity of floats (copper, iron, and wooden ones) with pieces of copper wire attached have drifted ashore on the coast from Haugesund to the North Cape.

Some of the mines had their floats and copper wire coiled up in the slip gear on the mine. The slip gear had failed to operate.

There was very rarely any water in the mines.

In some mines the nut on the hydrostatic safety spindle was screwed close down (the mine inactive).

In some mines the safety device for the primer had not operated (the primer in its place in the detonator).

In a few mines the metal ball had fallen down without firing the mine.

The mechanical condition of the firing apparatus was generally good. No rusting or corrosion was perceived.

Some mines had a circuit-breaking arrangement between the mine and the antenna, others not.

On several mines the copper tacks around the equator of the mine were much bent.

In some mines the primer had been fired.

The packings were throughout in a very good order.

ICE CONDITIONS IN THE EASTERN BALTIC AND GULF OF FINLAND.

Source: Reliable.

(12782.)

3 February, 1920.

The *Ballard* left Kiel, Germany, on 13 January, 1920, at 1.30 p. m., Greenwich mean time, en route for Hango, Finland, escorting the United States Army Transport *Buford*. The *Ballard* and *Buford* arrived at Hango at 2 p. m., Greenwich mean time, 16 January, 1920. The first ice observed en route to Hango was seen about 2 miles southeast of the entrance to Hango Harbor, in the form of a few small detached floes of drift ice. No ice of any consequence was encountered until the entrance to Hango Harbor was reached. From this point the harbor was filled with drift ice, broken up into floes about 12 inches thick. This drift ice was moved about by wind and tide. At times the harbor was practically clear; at other times the ice was closely packed in the harbor, but never to such an extent as to prevent free movement of steam vessels. When the *Buford* and *Ballard* left Hango the harbor was at that time practically clear of ice as a result of a combined effect of ebb tide and a northeasterly breeze. After leaving Hango Harbor no more ice was seen. The ice encountered in entrance to Hango Harbor did not seriously hamper the movements of the *Buford* and *Ballard*, but it subjected the sides of the *Ballard* to considerable strain, causing distortion inward of *Ballard's* plates at places along the water line to extent of about 1 or 2 inches, principally forward of frame 30. This distortion is gradual and apparently not serious. Its exact extent can be better determined when *Ballard* docks. No leaks resulted.

To southward of line between entrance of Gulf of Riga and Gotland Island the Baltic rarely, if ever, freezes over. When the *Ballard* visited Hango the Baltic was practically clear of ice to southward and westward of line between Reval and Hango. Libau, Windau, and Riga are practically ice free for navigational purposes. All ports in the Gulf of Finland are blocked by ice from about 1 January to 1 April; but ice breakers keep channels to open water free when necessary. Hango will doubtless be kept open to navigational winter. At present communication is maintained regularly between Hango and Stockholm by steamers. At the end of March the western part of Gulf of Finland begins to clear. The waters of the Baltic freeze at temperature of 30° F. Average daily temperatures during the *Ballard's* Baltic cruise were 14 January, 34°; 15 January, 32°; 16 January, 30°; 17 and 18 January, 30°; 19 and 20 January, 32°; 22 January, 34°.

INTELLIGENCE DIVISION OF THE BRITISH ADMIRALTY.

Source: Reliable.

Peace and War Time Organization.

Director		One admiral.
Assistant director		One captain.
		One captain (temporary war assistant).
Russian	1.	One naval officer.
	2.	One marine officer.
Scandinavian	3.	One naval officer.
	4.	One marine officer.
German and Netherlands	5.	One naval officer.
	6.	One marine officer.
		One temporary war assistant.
French and Spanish	7.	One naval officer.
	8.	One marine officer.
	9.	One naval officer.
	10.	One marine officer.
		One temporary war assistant.
American and far eastern	11.	One naval officer.
	12.	One marine officer.
Armaments	13.	One marine officer.
Engineering	14.	One engineer officer.
Communications	15.	One marine officer.
Air	16.	One marine officer.
		Two temporary war assistants.
Foreign intelligence	17.	One marine officer.
		Three temporary war assistants (watchkeepers).
Mercantile marine	18.	One marine officer.
Naval movements	19.	Two naval officers.
		Five temporary war assistants (three are watchkeepers).
British dominions and colonial	20.	One naval officer.

War Sections.

Censored letters	21.	Four civilians.
Legal	22.	Two civilians.
Trade	23.	One naval officer.
Special naval intelligence	24.	Three naval officers.

Special Spanish	25.	Two naval officers.
Special intelligence	26.	One civilian.
Contre espionage	27.	One civilian.
International situation	28.	One naval officer. Three civilians.
Geographical	29.	One civilian.
Government pigeons	30.	Two naval officers.
Publicity	31.	Five naval officers.
Personal secretary	32.	One naval officer.

Clerical Staff.

1 clerk in charge 1 assistant to clerk in charge 3 marking and registration clerks 13 clerks for sectional work 3 clerks for issue and custody of confidential books. 1 clerk for charge of charts	Augmented as necessary during the war.

Drawing Staff.

1 cartographer 6 draftsmen	Augmented as necessary during the war.

WORLD'S PRODUCTION OF CRUDE PETROLEUM.

Source: Reliable.

(12785A.)

13 March, 1920.

Production of crude petroleum in 1918, by countries.

	Barrels (42 gallons).	Per cent of total.
United States	355,927,716	69.1
Mexico	63,828,327	12.4
Russia	40,456,182	7.9
Dutch East Indies [1]	13,284,936	2.6
Roumania	8,730,235	1.7
India	[2] 8,000,000	1.5
Persia	7,200,000	1.4
Galicia	5,591,620	1.1
Peru	[2] 2,536,100	.5
Japan	2,449,069	.5
Trinidad	2,082,068	.4
Egypt	2,079,750	.4
Argentina	1,321,315	.3
Germany	711,260	.1
Canada	304,741	.1
Venezuela	190,080	.....
Italy	35,953	.....
Total	514,729,352	.....

[1] Includes British Borneo.

[2] Estimated.

LEADING JOURNALISTS IN JAPAN.

Source: Reliable.

4 December, 1919.

Hochi Shimbun.—Dr. Juichi Soyeda, president; Chiichiro Takata, managing editor.

Tokyo Michinichi Shimbun.—Hikoichi Motoyama, president; Rita Takagi, managing editor; Torao Fukura, political editor; Sueichiro Yamada, economic editor; Norinobu Matsuuchi, society editor; Seiichiro Ishimura, foreign editor.

Yomiuri Shimbun.—Sato Akizuki, president; Keibun Ishiguro, business manager; Shigemichi Yokoya, managing editor; Seiji Yamakawa, political editor; Nobuyoshi Kamitsukasa, art editor; Shichiro Okuno, foreign editor; Chogo Shimizu, economic editor; Shigeru Ota, society editor; Takeshi Matsumoto, ladies' page editor.

Chugai Shogyo Shimbun.—Kyujiro Harita, managing editor; Kohei Murakami, foreign editor.

Jiji Shimpo.—Sutejiro Fukuzawa, president; Kanmei Ishikawa, managing editor; Rozo Uematsu, editor; Chikao Hirano, editor; Shobi Shimoda, editor; Ki Tsusnima, political editor.

Chuwo Shimbun.—Shoichiro Yoshiue, president; Hirokichi Matsui, managing editor; Gyokujo Hanazawa, political editor.

Yamato Shimbun.—Yusaburo Matsushita, president; Hirokichi Matsui, managing editor.

Tokyo Asahi Shimbun.—Riichi Ueno, president; Seiichi Ueno, vice president; Seiton Ando, managing editor; Minoru Yoneda, foreign editor; Hitotaro Sugimura, statistical editor.

Kokumin Shimbun.—Shoichiro Tokutomi, president; Shinshi Miyashima, managing editor; Rikken Oma, political editor; Tsunego Baba, foreign editor.

Yorodzu Choho.—Shuroku Kuroiwa, president and managing editor; Jiro Sakaguchi, political editor.

ESTIMATED STRENGTH OF THE UNITED STATES ARMY.

Source: Reliable.

(12785A.)

9 March, 1920.

	Officers.	Men.	Total.
United States	15,389	175,811	191,200
United States possessions	1,285	27,257	28,542
Europe	770	16,311	17,081
Siberia	233	3,594	3,827
At sea, en route to United States	4	3	7
At sea, en route to Philippines	5	352	357
At sea, en route to Europe	17	8	25
Total	17,703	223,336	241,039

LESSONS LEARNED FROM THE WORLD WAR.

Source: Reliable.

(12785A.)

13 March, 1920.

The normal organization of an expeditionary army of 1,200,000 men, exclusive of Air Service, as revealed by the experience of the World War, would call for 407,040 infantrymen with rifles. This would be 34 per cent of the total force. Of these, however, only 108,544, or 9 per cent of the total, would be on the front line at any given time. Rifle strength does not include the machine-gun troops.

The normal organization of an expeditionary army of 1,200,000 men, exclusive of Air service, as revealed by the experience of the World War, provides for 30 divisions organized in five corps, of which only eight divisions would be on the front line at any one time; and of these, 50 per cent would be infantrymen with rifles. The latter number constitutes only 9 per cent of the total expeditionary force. Rifle strength does not include the machine-gun troops.

STEEL RAILS, PRESUMABLY FOR SIBERIA.

Source: Reliable.

(7010-A.)

5 February, 1920.

During January there have been rumors of large shipments of 12-pound rails being imported into this country for the Japanese Government. Information received confidentially on the 1st of February from a reliable source states that there have been more of these light rails imported here recently than can possibly be used in Japan for years to come.

The orders have been placed not through one firm, nor two firms, but through a number of brokers, apparently for the purpose of covering up large shipments. Many of the steel men here are aware of this situation but do not know what to make of it. The source of information states it to be the general belief that they were to be used in Siberia by the Japanese Government in case such extreme measure becomes necessary.

NEW BATTLE CRUISER "AKAGI."

Source: Reliable.

(11966.)

5 February, 1920.

Work on the battle cruiser *Akagi* was expected to begin at the Kure Dockyard in 1919, but owing to the difficulty of securing materials and the extension of the yard construction will not be begun until June or July of 1920.

The *Akagi* will be a 40,000-ton battle cruiser, about 10,000 tons larger than the *Nagato,* which was launched at Kure last fall. She will be 850 feet long, 120 feet wide, and will make 30 knots. She will probably have a main battery of eight 16-inch guns.

From lessons learned during the European War, it is expected that the *Akagi* will mount antiaircraft guns and protection, and will have slipways for the launching of aeroplanes from her deck.

She will burn oil exclusively.

JAPANESE TRADE IN SOUTH AMERICA.

Source: Reliable.

(11844.)

17 January, 1920.

In their endeavor to expand their trade to South America upon lines formerly done by the Germans, Japanese samples of imitated products made by United States and European manufacturers are now beginning to arrive in Chile. The goods of these manufacturers are cheaply imitated and sold with long-credit terms. In Peru the Japanese are still collecting samples of United States goods imported into this country, with the idea of imitating these goods and selling them in Peru at cheaper prices.

OPERATIONS.

GENERAL PRINCIPLES CONCERNING THE DEFENSE OF COASTS BY ARTILLERY IN FRANCE.

Source: Reliable.

(12805.)
(A translation.)

24 February, 1920.

GENERAL PRINCIPLES.

The purpose of the present article is to fix the general principles of the defense of coasts by Artillery, as shown by the teachings of the war.

The different kinds of operations which an enemy could undertake against our coasts are successively examined. The methods of defense against the type of attack considered will be deduced. From this will be evolved the principles which should be followed in planning and organizing a system of coast defense by Artillery.

The different kinds of attacks are:

I. Day bombardment.
II. Night bombardment.
III. Port blocking operations.
IV. Surprise attack and attempt at landing.
V. Bombardment by submarines.
VI. Blockade by submarines.
VII. Aerial bombardments.

The enemy may be—

I. On the sea surface or submarine vessels.
II. In the air.

In both cases the enemy can and must be counterattacked by aerial forces.

The defense of a coast thus must include aerial forces, which must be very strong. It represents a most important element, if not the most important, in a defensive organization.

Its organization should be studied by the proper services.

The present study treats only defense by Artillery principally against a hostile fleet.

Day Bombardment.

LONG-RANGE BOMBARDMENT AND ATTACK.

A hostile squadron executes a bombardment against a commercial or military post, at the maximum range allowed by its armament.

At such a range it can only contemplate covering a more or less extensive area, such as an arsenal, a port, docks, building ways, etc., with its projectiles. For that purpose it will have aeroplanes to adjust the fire, flying over the place attacked. The fleet will protect itself against the fire of coast batteries by smoke screens, and in consequence of this will be able to approach fairly close.

Maximum range, 20 to 30 kilometers or greater.

Caliber of guns, 360 mm. and even 450 mm. (English monitors).

The enemy can hope to destroy by a lucky shot some vital establishments. But in practice, the results will be mediocre on account of the uncertainty of the fire, the difficulty of observing the points of fall and of making the adjustments of fire even when observation is carried out from an aeroplane.

System of Defense.

Use Artillery with a range and caliber at least equal to that of the attacking vessels, and concealed from view from the sea.

The vulnerability of a ship and the invulnerability of a shore battery firing indirectly is a very unequal engagement, and the enemy will not consent to remain under fire of an Artillery against which he feels himself powerless.

This rule must be adhered to as necessary and sufficient as far as the choice of caliber and model of pieces destined for coast batteries is concerned. It seems to have been forgotten before the war. The ranges of Coast Artillery guns probably will attain 40 to 50 kilometers. It goes without saying that if Artillery progress makes it possible to design larger guns for shore use, it will be advantageous to adopt that caliber.

In view of the long ranges of the engagement, and the difficulties which result from this fact in observing and adjusting fire, it is not possible to contemplate, in the actual conditions of things, the immediate destruction of the enemy.

It will be sufficient and satisfactory to develop interdiction fire, such a fire as to cause a certain number of shots, from the very first salvos, to fall around the enemy, so that he will feel himself straddled and the morale effect will prevent his continuing the attack.

It was in this way that the Germans proceeded on the Belgian coast, opening fire with ranges in echelon from their batteries (each battery had four pieces, translator's note) so that the dispersion was increased and the target was straddled from the first shots.

In an offensive of this kind, which should be instantaneous, will be added protection by smoke screens, thus preventing the enemy from adjusting his fire, either by direct observation or by aeroplanes.

Against attacks by aircraft, the means of defense will be camouflage and mobility.

Camouflage can prevent an aerial reconnaissance from determining the position of the guns; but it is still better if a photographic or other reconnaissance has succeeded in locating a battery upon returning to attack the aeroplanes no longer find the guns in the emplacement which they had located. In this way the use of a mobile railroad artillery of great caliber and long range or else a mobile road artillery, both types capable of all-round fire from emplacements studied and prepared in advance, seems advisable.

The mobility will constitute the most effective element of protection both against a hostile fleet and against aerial bombardments. It will have the additional advantage of permitting the concentration on a threatened portion of the coast of all batteries which can be brought there, resulting in the organization of a much more powerful defense than could have been had if all guns were fixed along the coast. This gives considerable economy in matériel.

The ideal organization would be to have a continuous railroad along the entire coast, but this is impossible for various reasons.

There is no limit practically to the caliber of railroad artillery, so whenever there is trackage guns of the greatest caliber in existence can be brought up.

Where the configuration of the country prevents, the roads will have to be used. But the capacity of the roads limits the caliber.

It is thus seen to be necessary to consider the installation of powerfully protected fixed batteries.

It will thus be necessary to construct branches of railroads in certain cases, and an effort will be made to find a commercial value for such lines. Emplacements for installation of guns will be prepared in advance. (The war showed that railroads damaged by aeroplane bombing were generally repaired in less than four hours. It is thus seen this is not a very serious consideration.)

Whether the emplacement be designed for mobile or fixed artillery, they should be at least 1,000 meters from the shore line, so as to make location of batteries by aeroplanes more difficult.

The emplacements will be carefully camouflaged.

False emplacements and false camouflage will be prepared.

Near Bombardment and Attack.

A large hostile fleet, accepting the risk of certain losses to obtain a result of great importance, can disregard the fire of large-caliber batteries, draw near to its objective at high speed under cover of a smoke screen, and concentrate its bombardment of an arsenal, port, or city, the destruction of which, even in part, would have a harmful effect on our power.

Defense.

As the enemy approaches the coast, receive him by an ever-increasing volume of fire executed:

At first by major-caliber artillery, which will be reinforced by medium-caliber artillery as soon as this artillery can be used, in certain anchorage by old guns used as howitzers.

It can be stated as a general principle that, in order to have sufficient volume of fire, the number of medium-caliber guns will have to be about double the number of major-caliber guns.

The great number of batteries furnishes a certain protection from the shots from a fleet, which can not scatter its fire on too many targets. In addition, as in case of major-caliber guns, protection will be furnished by smoke, camouflage, and mobility.

The principle of mobility will be applied to medium guns also, but in this case greater use can be made of narrow-gauge tracks and roads, and fire can be more easily opened from the railway or road without preparing an emplacement.

Medium-range guns will be located as near as possible to the coast.

Larger guns will be generally concealed from the sea, and will be designed generally to use indirect fire. Rapid-fire batteries will use direct fire and will be located so as to eliminate as far as possible dead space. These batteries must be provided with means for indirect fire so that they will be able to use zone firing and will be able to fire when they are protected by a smoke screen.

Mobile batteries must be able to open fire without delay on arriving in position. Emplacements are prepared in advance if the matériel requires it. For indirect fire this preparation is always necessary. It may be limited to establishing certain aiming points.

HOWITZERS AND MORTARS.

A large number of howitzers and mortars are available. They will be able to be used for close defense to increase fire to stop the advance of an enemy through a harbor entrance or narrow channel. These batteries will be defiladed from the sea and will use indirect fire. They will be able to fire in all azimuths. Same conditions of protection, camouflage, and mobility as for medium guns.

NIGHT BOMBARDMENT.

Sudden night attacks, made principally by light vessels, moving at high speed, may succeed if cleverly and resolutely led. In their attacks on our northern ports, German light craft only revealed their presence by opening their fire. They opened fire in passing close to some fixed point chosen in advance, probably a luminous buoy. The attack lasted only a few minutes. Afterwards the ship disappeared in the darkness, never being well located, especially if,

as was generally the case, they used nonflash powder. These attacks evidently could have no great military value, but they reacted on the morale of the civil population, and kept the garrison in a state of continual watchfulness.

DEFENSE.

Above all, develop all the methods possible of discovering the enemy before he is able to commence his attack.

To this end, a reconnaissance organization must be carefully developed, involving the following:

Detection by microphone or magnetic apparatus sufficient to prevent hostile vessels from approaching a point without revealing their position.

This problem is partly solved by the microphones actually in service. But it seems susceptible of a better solution permitting the determination of the position of the enemy with sufficient approximation to open fire on him.

Sound ranging: This method will permit the determination of the enemy's position by his firing, even if he fires with nonflash powders.

Illumination by projectiles and bombs, and in very particular cases by searchlights.

In coast defense, searchlights are generally more harmful than useful. They have a limited range (3,000 to 4,000 meters at most). On the contrary they can be seen from a long distance, and can be used as aiming points.

They have the additional disadvantage of silhouetting the patrol vessels and revealing them to the enemy.

The use of searchlights must be limited to the case where the enemy, already discovered, is so close that the searchlights no longer aid him, but, on the contrary, blind him, conceals his targets from him, and illuminates sufficiently to permit our adjustment of fire. Outside of this particular case, the use of searchlights must be forbidden.

The illumination of the coast must depend on illuminating projectiles and bombs of various kinds.

When the enemy is sighted, the fire of the coast batteries must be as intense as possible, and due to the rapidity of the attack, and the impossibility of any fire adjustment, zone firing must be used.

The field of fire is divided into a certain number of zones. A system of concentration and distribution of fire of all the Artillery capable of entering into action is arranged. Opening fire is secured by a simple signal, instantaneous, which indicates at the same time the zone to fire on.

All guns of all calibers must participate in zone firing up to their extreme range so as to secure the maximum fire intensity.

As an indication, in very vulnerable points such as the entrance to a harbor, a narrow channel, the density of fire on a zone will approximate, without exceeding the following limits:

1 projectile of 100 to 120 m. m. every 100 meters.

1 projectile of 120 to 240 m. m. every 200 meters.

1 projectile of caliber greater than 240 m. m. every 300 meters.

Illumination of targets is assured by illuminating projectiles under the same conditions as during the search. The use of searchlights must be limited conclusively to the case where the enemy, already discovered, is less than 2,000 meters from the coast.

The same rules apply in case of fog and in case of approach of fleet behind smoke screen.

BLOCKING OPERATIONS.

Attempt at blocking operations will probably only occur at night. Favored by darkness, under cover of smoke, with all sorts of diversions, the enemy reaches the entrance to a port and sinks there some old vessels.

The operations carried out by the English against Zeebrugge and Ostends have proved, that by virtue of surprise attacks of this nature, audaciously conducted, have good chance of success, especially if there is the least delay in replying to this attack.

Defense.

Above all, try to avoid surprise. Use the methods of reconnaissance same as indicated for counteracting night attacks.

Use zone fire.

Use batteries of guard ships. Provide among these vessels a ship (monitor, for example) armed with a good medium rapid-fire battery that will be anchored each night as near as possible to the entrance of the port, and in a position where it will not obstruct the channel if sunk. The enemy at the end of a delicate maneuver from the military point of view, blinded by searchlights and an intense fire, finds himself suddenly face to face with an obstacle whose presence was not suspected and whose value he does not know. His plans will be upset, and the success of his enterprise will be greatly compromised.

Torpedo tubes can be supplied along channels.

Light all searchlights. They must be sufficiently numerous, and must be employed, some to conceal the monitor and the entrance of the port, others to illuminate the attacking vessels and blind the navigators.

Complete the defensive system by light artillery, automatic guns, machine guns, infantry defense, as indicated hereafter for the defense against raids.

Attempts at debarcation on a point of the coast may be either:

A raid for the destruction of works, ports, docks, support a blocking attempt, etc., the operation being finished the enemy reembarks and withdraws, or

A debarcation on a favorable point of the coast with intention of continuing the operations in the interior of the country.

Defense.

Same means of defense as against night attacks.

Add to this the laying of mines, barbed wire, fougasses, machine-gun nests, light artillery, automatic guns. This is duty of the army.

The nature of the terrain will indicate points where attempts of this kind may be undertaken.

The defensive organization of the Belgian coast by the Germans and the Allies is a model. The multiplication of defenses found here can not be contemplated, however, for all ports. A solution must be found for each particular case.

Attempt at Debarcation.

The only defensive means are railroads and other mobile artillery.

Nevertheless in certain anchorages, particularly adapted to debarcations, some howitzer or mortar batteries may be installed permanently to cover the anchorage (example, Bay of Douamey, Salinz d'Hyeres). These batteries will be defiladed from the sea, rather than withdrawn from the coast for protection from raids, and will have all round fire, indirect aiming, numerous fire-control stations and be well camouflaged.

An attempt at debarcation will have two phases:

First phase.—Landing of infantry on a favorable point. The Dardanelles proved this operation to be feasible. It is impossible to foresee it, so to speak, and to prevent it, given the development of matériel and the rapidity of landing personnel (12,000 men an hour at Sugla in August, 1915).

Second phase.—Bringing up supplies and supports. This means concentration of ships of all kinds. Concentrate all mobile artillery and bombard by aeroplanes and dirigibles. Emplacements and observation posts should be anticipated and prepared in advarce, so as to be able to use indirect fire.

Bombardment by Submarines.

In a general way, the submarine is not designed to attack a coast. But such attacks must be considered possible. Already submarines armed with 12(?)-inch guns and with 20 knots speed on the surface are in existence. They may thus bombard from long range or at night.

In the first hypothesis, the reply by major caliber artillery seems difficult, given the low visibility of the target. The intervention of patrol boats and aerial forces must be especially contemplated.

In the second hypothesis, zone fire must be used.

Blockade by Submarines.

Submarines may blockade the coasts to prevent coastal trade and fisheries and to attack lighthouses and fishing ports, bridges, etc.

The experience of the war has shown that whenever reply has been made to such attacks by gunfire, the submarines never returned within range of shore guns.

A numerous system of posts armed with 155 or 166 m. m. guns capable of firing up to 17 or 10 kms., should suffice. To protect navigation farther out, patrols and aircraft must be used.

These posts will generally be armed with two rapid-fire guns, capable of indirect fire in case of a smoke screen.

On the rest of the coast, guard posts will be established to notify aviation and patrols of enemy activity.

AERIAL BOMBARDMENTS.

One of the most considerable risks in a future war for coastal cities is going to be the danger of aerial bombardment. The frequency and rapidity of these attacks, the number of machines in action, and especially the quantity of explosive dropped, will render these attacks by far the most dangerous and the most difficult to repel.

The Army is charged with aerial defense. But the matériel of medium and minor caliber coast batteries should generally be adapted for use against aircraft. If necessary special antiaircraft batteries will be established near the permanent works.

Against day attacks, reply by antiaircraft batteries and pursuit planes. Protection of batteries by camouflage and smoke screens.

Against night attacks, smoke screens, but protection of batteries best obtained by their mobility, which will always leave the enemy in ignorance of their exact position.

RÉSUMÉ.

The following general principles result from the preceding considerations:

I. Defense at Long Range.

1. The defense of a coast position includes the use of major artillery of long range (30 to 50 km.) and of a caliber of at least 350 m. m.

2. Generally this artillery is mobile, moving on railroads, or if possible on roads. This mobility constitutes the most effective element in its protection.

3. Where railroads or roads can not be built, fixed batteries are installed.

4. Generally the batteries are defiladed from view from the sea, located at least 1,000 meters from the shore line, and use indirect fire.

5. They must be sufficiently numerous to keep the enemy at a distance beyond the range of his guns from the place to be defended.

6. Their positions must be chosen in such a way that the enemy is under fire from all the batteries wheu he is within 20,000 meters of the place.

7. "Firing position" means the entire system of emplacements observing all battery commanders' stations, bombproofs, and system of communications.

8. Mobile batteries must have a certain number of "firing positions" organized in advance so that upon their arrival, the guns may open fire without delay. The different positions will be about 2 kilometers from each other.

9. The principal artillery is especially used against battleships at long range. Further, at night or during fog, or in case the enemy advances under a smoke screen, it aids the close-in defense by zone firing.

II. Defense at Medium Ranges.

1. Guns of medium range are installed to—
   (*a*) Complete the defensive organizations of a port with a view to its defense at shorter ranges.
   (*b*) Flank long-range batteries.
   (*c*) Defend the coast, either against debarcations or against submarine attacks.
2. Generally this artillery is mobile on railroads or roads.
3. Where railroads and roads can not be constructed, fixed batteries are installed. Fixed positions are also needed for the protection of certain constructions, ports, localities, etc., which might be subject to sudden attack against which an immediate reply is required.
4. Medium range batteries are installed as close as possible to the coast. Batteries with rather slow fire are normally organized for indirect fire.

Very rapid-fire batteries normally use direct fire, but will be furnished with apparatus for indirect fire.

All-round fire is essential; the distance between pieces depends on the caliber.

Each battery generally consists of four guns. For a rapid-fire battery, two guns may suffice.

5. The armament of a seaport in medium-range artillery will be calculated so that every point on the sea up to a distance of 20,000 meters around the place will be covered by fire from a number of medium-range guns equal to double the number of long-range guns.

6. Battery positions will be chosen with a view to support and flank the long-range batteries, leaving no dead space.

7. As for long-range mobile artillery, medium-range mobile guns will have a certain number of "firing positions" organized in advance, and separated from each other by 2 kilometers.

8. Medium-range artillery is organized so as to be able to use zone fire in case of fog, night attacks, when smoke screens are used.

9. Where blocking attempts are to be expected, some rapid-fire pieces will be especially and exclusively installed for the protection of channel entrance.

III. Howitzers and Mortars.

1. Large caliber howitzers and mortars may be used to supplement fire of medium-range guns, in narrow channels or to defend an anchorage.

2. Conditions of installation and use are the same as for medium-range artillery (mobility, all-round fire, zone fire).

3. They are defiladed from the sea and normally use indirect fire.

IV. Light Artillery.

1. The entrances to ports and certain particularly vulnerable points will be defended against raids by means of light artillery (100 mm. and under) and by Infantry.

2. Light artillery will be in fixed position and of rapid-fire type.

3. It must have all-round fire.

4. It will ordinarily use indirect fire, but will be able to use indirect fire for participation in zone fire.

V. Protection and Camouflage.

1. Protection in positions of mobile batteries will be reduced to same bombproofs or extemporized protection for personnel.

2. In fixed batteries protection will be as powerful and as complete as possible for matériel, personnel, and ammunition.

3. Very carefully studied camouflage will conceal all installations from view from the sea and air.

4. False positions and false camouflage will be used.

5. Batteries of light artillery will be supported by Infantry defenses, trenches, barbed wires, machine guns. For the defense of a beach and to prevent debarkations, fougasses and mines close to the coast will be installed.

6. When long-range and medium-caliber batteries may be attacked without warning, they will have a similar protection.

7. Smoke-screen apparatus will be supplied for concealment against airplane.

VI. Illumination and Observation.

1. Forbid use of searchlights for searching.

2. Limit their use to cases where the attack has commenced, and where the enemy, already discovered, is at short range.

3. Insure the illumination of the coast by means of illuminating bombs and projectiles.

4. In each battery of medium-range guns and in each antiaircraft battery, designate one piece for firing illuminating shell.

5. Install microphone and magnetic-detector apparatus to reveal the approach of an enemy, and sound-ranging apparatus to determine position of enemy by his fire, in case of fog or at night, in case he uses nonflash powder.

VII. Aviation.

1. Pursuit, reconnaissance, and spotting aeroplanes must be available and carefully developed.

2. Use all guns of medium and light caliber for antiaircraft fire.

BRITISH TARGET PRACTICE, FIRING AT RADIO-CONTROLLED SHIPS, ETC.

Source: Reliable.

(12763.)

28 February, 1920.

The Naval and Military Record of 26 February, has the following:

"Novel fleet gunnery.

"It is understood that the gunnery exercises which are to take place when the fleet assembles at Berehaven next month at the close of its Mediterranean cruise will be of a novel and highly instructive character. For obvious reasons no official details of the program have been published, but it is known that the targets on this occasion will include a number of obsolete vessels, including the battleship *Swiftsure*, which have been specially prepared for the purpose. Since the battle of Jutland the entire gunnery organization and equipment of the fleet has been modernized, but unfortunately our late enemies gave us no opportunity of testing the result. The Admiralty has therefore done well to invest the coming gunnery exercises of the fleet with every practicable element of reality. The firing will be at ranges undreamed of in prewar days, and it is expected that valuable data concerning the various systems of "spotting" and the effect of our new projectiles on armored targets will be obtained."

It is extremely difficult to find out anything about this target practice except in general terms. One specific piece of information, however, which may be of interest deals with the ammunition to be used in this firing. It has been stated that this practice was not in any sense a test to determine the effect of gunfire. That would be tested

quite differently. This firing was for gunnery purposes, pure and simple. In speaking of the advantage of a full dress rehearsal, it was stated that work of this kind would be particularly interesting and necessary in connection with concentration of fire. In connection with concentration of fire it is thought that in this class of firing several ships would fire at once.

Concentration fire was, of course, primarily developed with the idea of being able to do something when the number of targets visible through smoke screens and under North Sea conditions did not equal the number of ships which were available to fire at the targets. Even when visibility was excellent it would be good tactics to maneuver so that a large number of our own ships could concentrate on a smaller number of enemy ships when the rest of the enemy forces were out of range. The soundness of this reasoning is not open to argument, but there are certain enthusiasts on concentration fire who would go even further. Many British gunnery officers with equal fleets in parallel columns, do not subscribe to the doctrine of firing simply at the opposite ships.

Some of them believe that it is well for a division to concentrate on a flagship or on a leading ship and finish that ship off completely and then direct attention to another one. The older doctrine was best on a supposition that several ships firing at the same time would not benefit by each other's fire, but each one of them would be hindered because they did not have the target exclusively for their own use. Radical gunnery opinion in England often denies this. The fall-of-shot indicator has fixed things so that one does not get his splashes mixed with the splashes of the other ship. The rate of firing is not so fast but that all will have a chance of getting off what ammunition they wish without delay if the drill is good. Also the spotting corrections are not useful to any one ship alone, but are common property of the whole firing division, and are instantly available for all the other ships firing at that particular target. Gunnery has developed so that they think this is the case. Furthermore, if ships are zigzagging, the job of destroying the target is done more rapidly if several undertake it at once under these conditions and, since the rate of firing and rate of spotting are greater and the time to destroy the ship is less, the target ship will have much less chance of escaping.

They admit that to leave some ships unattended while concentrating perhaps on the leading ship of a division has disadvantages as there is, at the time, scarcely any destruction of enemy morale on ships which are not under fire. But they point out that, if the leading ship is finally disabled and throws the line into confusion, it has a tremendous effect upon the morale of the enemy as the other ships pass it in a sinking condition.

How to accomplish concentration fire is well understood and has been the subject of much drill. This practice appears to be for the purpose of determining the circumstances under which it may be advisable to use concentration fire at times when the other kind of firing is equally possible and at times when under our older doctrine we would ordinarily use individual fire. In other words, by actual test it will be endeavored to learn whether it is better business to fire at all possible targets of the enemy or whether it is better to concentrate in succession on certain individual ones and, if so, whether the concentration should be done by divisions or by some other number of ships. There are some who would only use concentration firing when necessary; there are others who would use it occasionally and under certain circumstances, and perhaps a certain number would have all fleet firing done by concentration divisions. One can not safely agree with the extremists of either class. Between the two extreme ideas there are all possible shades of opinion favoring the use of concentration fire to varying degrees. The coming test appears to be for the purpose of making comparisons and furnishing data from which the soundest doctrine may be worked out.

As regards the ammunition, the ordinary target shell has been found to do much more damage to the ship than was expected. Only old ships with light horizontal armor are available. The range and the angle of fall will be very great. A target projectile hitting the ship is likely to go on down through it and sink it and, in some ways, do more damage than as though it burst higher up in the structure of the ship. Of course, a burst well put in the ship's structure would probably disable more personnel, but this would not apply in the case of radio-controlled target ships. They made a certain number of preliminary tests to see what could be counted upon in the way of having the target ships endure the fire of target projectiles. The target projectiles under the conditions of test did so very well that they are seriously embarrassed and are afraid that even with the worst type of target shell the ship will be sunk very much too soon. They have experimented with loaded and fused projectiles and think that they are, after all, somewhat more suitable ammunition for this purpose. They would not want to fire service ammunition because of the expense. The latest idea is to have target practice ammunition of very poor penetrating qualities and to load it with explosive and to fuse it with a very sensitive fuse. This, it is hoped, will not only result in breaking up the projectiles so that they will not sink the ship but will also give the added benefit that is obtained by having the firing ships see the bursting projectiles.

ASSIGNMENT OF SHIPS TO THE JAPANESE NAVY.

Source: Reliable.

(7525-A.)

29 January, 1920.

The following ships are in full commission:

Superdreadnaughts: *Fuso, Hiuga, Ise.*

Dreadnaughts: *Satsuma, Aki.*

Predreadnaughts: *Shikishima, Asahi, Hizen, Katori.*

Battle cruisers: *Kongo, Haruna, Hiei, Kurama, Ibuki, Ikoma.*

Large cruisers: *Tokiwa, Azuma, Yakumo, Nisshin.*

Light cruisers: *Hirado, Chikuma, Tone, Niitaka, Tenriu, Tatsuta.*

First-class gunboats: *Mogami, Yodo.*

Second-class gunboats: *Ugi, Fushimi, Saga.*

Second-class coast defense: *Manshu, Karasaki, Yamato, Musashi, Matsuye, Kombashi, Wakamiya, Chihaya.*

The number of ships of the following class are in full commission:

Flotilla leaders: None in Japanese Navy.

Destroyers: Sixty-nine (8 first-class destroyers, 1915–16; 16 second-class destroyers 1911-1917; 45 third-class, 1898–1909).

Submarines: 19.

Torpedo boats: Twenty-six (16 first-class, 1899–1904; 10 second-class).

Names of the following ships in ordinary or reserve (no ships in ordinary, following in reserve):

Superdreadnaughts: *Yamashiro.*

Dreadnaughts: *Settsu.*

Predreadnaughts: *Kashima, Iwami, Mikasa, Suwo.*

Battle cruisers: *Kirishima.*

Large cruisers: *Kasuga, Aso, Idzumo, Iwata, Asama, Chiyoda, Tsushima, Kuma, Okinoshima.*

Light cruisers: *Yahagi, Otawa, Tsugaru, Chitose, Akashi, Akitsushima, Hashidate, Itsukushima.*

Number of ships of following classes in ordinary or reserve:

Flotilla leaders: None in Japanese Navy.

Destroyers: None in this status.

Submarines: None in this status.

Names of the following ships out of commission or to be put out of commission:

None in this status.

Number of the following classes out of commission and to be put out of commission:

None in this status.

Names of the following ships to be scrapped:

None in this status.

All vessels except the following will be kept in home waters:

Hizen.—At Vladivostok, 12,700 tons, four 12-inch and twelve 6-inch guns. A predreadnaught launched in 1900.

Nisshin.—First-class crusier, 7,700 tons, four 8-inch and fourteen 6-inch guns. South Sea patrol squadron.

Tone.—Second-class cruiser, 4,100 tons, two 6-inch and ten 4.7-inch guns. South Sea patrol squadron.

Tokiwa.—First-class cruiser, 9,826 tons, four 8-inch and fourteen 6-inch. Midshipman training ship, cruising in Mediterranean and Dutch East Indies, and Manila.

Yakumo.—First-class cruiser, 9,700 tons, engineer training ship, cruising on west coast of United States and Mexico.

Suma.—Small cruiser, 2,700 tons, two 6-inch guns and six 4.7-inch. On Yangtze River.

Sumida.—Gunboat, 126 tons, on Yangtze River.

Toba.—Gunboat, 250 tons, on Yangtze River.

Uji.—Gunboat, 620 tons, on Yangtze River.

Adzuma.—First-class cruiser, 9,426 tons, four 8-inch and fourteen 6-inch. Midshipman training ship, cruising in Mediterranean and Dutch East Indies, and Manila.

Fushimi.—Gunboat, 180 tons, on Yangtze River.

Saga.—Gunboat, 785 tons, on Yangtze River.

The *Fuji* is an old battleship which is serving as a training ship of seamanship at Kure Naval Station.

The *Asahi* is a gunnery training ship at Yokosuka.

Ships in reserve have special crews or complements of one-half to full strength, depending on repairs or duty assigned.

INTERNATIONAL.

SITUATION IN THE FAR EAST.

Source: Reliable.

1 February, 1920.

Japan.

Japan is essentially a military nation; monarchistic in ideas and methods. The Military Party is in actual control of the Government. Statements and explanations made by the Premier and the foreign office may be made in good faith, but the Military Party carries out its policy without regard to the other branches of Government. The Emperor's authority is only a cloak to cover acts of the elder statesmen who control all policies. Taxes are high, cost of living great, wages are increasing, and strikes are frequent. There are not a few millionaires, and wealth and poverty are unequally distributed to a marked degree. However, the Military Party does not fear Bolshevism unless their policies prove unsuccessful, largely because communication in Japan is too poor for Bolshevism to affect the population except in large cities. Should Japan be defeated by Bolshevik Russia in Siberia, the Government would doubtless fall.

There appears to be no lack of funds for purposes of propaganda, Chinese loans, or commercial development, but funds available for extensive military operations are inadequate. The expense of the prolonged campaign in Siberia is already burdensome and the occasion of unfavorable comment in Japan. The reinforcement of the present expeditionary force will increase these expenditures with corresponding increasing popular discontent, and, unless results satisfactory to the Japanese people are soon obtained, it seems certain that the fund will be cut off and the Military Party discredited.

Japan could not carry on an extended war without recourse to the raw materials of China and Siberia. Furthermore, Japan is not self-sustaining in food supplies. The command of sea routes to China and Siberia would be essential to the continued prosecution of war, and it has been recently remarked by a well-informed observer that in case of war with Japan the quickest way to end it would be to cut off her lines of communication with China and Siberia.

The population of Japan is 59,000,000, but the density of population is not as great as that of certain industrial centers in Europe, with this difference, however—that in those centers the surface is

flat, while in Japan the natives have to cling to the terraced mountain sides, which are more difficult to cultivate. An informed writer on the Far Eastern question has recently remarked that in the last 15 years Japan has sent less than 350,000 colonists to Korea, and that immigration to Formosa is decreasing. Recent press dispatches state that not a few of the Japanese colonists in Mindanao are returning to their home country. There is no doubt that Japanese immigration has been drawn to America by high wages and great markets. One writer remarks that if California were uninhabited the Japanese would not think of going there.

Japan clearly desires to control the resources of China, Siberia, and certain South Sea Islands, all of which are necessary, first, to make Japan self-sustaining in peace and war, and, as a secondary proposition, to secure territory suitable for colonization.

Japan is purchasing or seizing coal and iron mines in China and Siberia and developing the phosphate and oil producing islands of the South Seas, north of the Equator. For colonization purposes, she intends to utilize the Philippines (notably Mindanao), where about 30,000 Japanese have already settled, and also the Hawaiian Islands and such islands in the South Seas as the Ellice and Marshall groups. Probably on account of their own island home the Japanese appear fascinated by these fertile and salubrious islands. On the other hand, the climate of Korea, China, and Manchuria and Siberia does not appeal to them, and efforts to colonize in these countries have been unsuccessful.

Japan's greatest ambition is to control the commercial shipping of the Pacific, and to this end she gives every possible support to her own shipping when in competition with foreign ships. During a recent passage through the Inland Sea, an unusual number of small vessels on the ways in course of construction along the coast were observed. These are apparently motor schooners, presumably intended for the South Sea trade. Japan also aims to secure preferential treatment of her merchants in Siberia and Manchuria.

That Japan has dreams of world power is probable, but there are no indications at present of a desire on her part to parallel the ambitions of Germany, doubtless through fear of being overtaken by the same fate, although she would not be adverse to getting in touch with reorganized Germany and Russia in the future.

Japan is an opportunist and endeavors at any cost to be on the winning side in any international conflict. In Siberia the course that Japan will pursue after the evacuation by the American troops must at present be conjectural, but undoubtedly she is much disturbed by the success of the Bolsheviki in Russia, with whom she may be drawn into conflict of greater proportions than she anticipates. By their personal attitude as well as official, and their monarchistic tendencies,

the Japanese have become alienated from the Siberian people, and it is a matter of everyday comment that she has incurred the hostility of the masses in China, as well as Siberia, being supported at present only by men like Semenoff and his followers, but whom the Japanese are now outwardly repudiating.

Japan's policy in the Far East is one different and difficult for the western mind to accept with equanimity, and her dealings with China have subjected her to severe criticism. She lends money to Chinese Provinces in return for concessions, when it is well known that this money is often used for individual military purposes. Money that is loaned in this way tends to local disturbances, and China is thus kept in a state of internal unrest and tumult.

Japan depends on the eventual independence of the Philippines to give her unrestricted opportunities for colonization and final control, and she would not consider a war with the United States necessary to obtain the Philippines.

America is generally regarded as the rival of Japan in the Far East, but Americans are not more unpopular with the Japanese than are the British or French. Germans are liked, but they are not much in evidence. America is regarded by the Japanese as easy-going and idealistic, but of great potential strength.

War between the United States and Japan might come from either one or two causes: First, our discrimination against her in the matter of immigration, and, second, an attempt by her to obtain commercial supremacy in the Far East by closing the door of equal opportunity against all other nations. In the meantime she is anxious to maintain friendly relations with America.

In contrast to Japan's present activities in China and her policy in the Far East, attention is invited to the following extract from an imperial edict, which is dated nearly 20 years ago:

"Our imperial ancestors have founded our empire on a basis broad and everlasting, and have deeply and firmly implanted virtue; our subjects, ever united in loyalty and filial piety, have from generation to generation illustrated the beauty thereof. This is the glory of the fundamental character of our empire and herein also lies the source of our education. * * * Bear yourself in modesty and moderation; extend your benevolence to all."

Forces.

In Japan (active)	176,000
In Siberia	57,000
In Manchuria	11,000
In China	10,000
In Korea	24,000
	278,000

China, population 425,000,000.

China is a Republic in name only. The overthrow of the monarchy resulted in the establishment of 18 separate autocratic governments instead of one. As in Japan, the Military Party predominates, and the military forces in the 18 different Provinces are controlled by military governors—Tuchuns—each commanding an army of from fifteen to thirty thousand men, and each semiindependent. The nation is divided into two factions, the northern and the southern, by a standing feud, which is thousands of years old. The Yangtze River is the Mason and Dixon line of China. The central government at Peking has little control over the Tuchuns of the north, and is practically not recognized by those of the south. Marshal Tuan is recognized as the leader of the Peiyang, or Military Party in China. Although not now in office, he is the acknowledged head of the Military Party, and is looked upon as the power behind the throne; it is commonly believed that he will be the next President. Marshal Tuan was at the head of the cabinet for three terms. He commanded the first army that fought against the revolutionists at Wuchang in 1911; he overthrew the monarchial government movement of Gen. Chang Hsum in July, 1917, and restored order in Peking.

Canton is the seat of the military government in south China. The central Government of the southern faction consists of a council with seven members acting as a cabinet. This council, however, has but little power. The military Tuchuns, through their command of troops, are practically supreme in each Province. The Provinces of Yunan, Kwangsi, Kwang Tung, and Kwei Chow are wholly controlled by the south, but Szechuan, Hunan, Kwangsi, and Fukien are occupied by both northern and southern soldiers. The other Provinces are under Tuchuns of the northern faction, but many are lukewarm in their adherence.

At present there is a convention in Shanghai, in which both factions are represented, convened for the purpose of coming to some agreement to restore national unity. The trouble in China is that there is no centralization and no concentration. There is but little intercommunication; only a very small percentage of the people ever see a newspaper; the vast majority of the hordes are illiterate in China and are under the domination of political aspirants, and know nothing about the franchise, and care nothing, being interested only in their own small personal environments. No outside nation realizes this condition more clearly than does Japan, and she has used it to her own best advantage. The leaders in China realize their helplessness and they are fully aware of the turbulent elements which are at work. The propaganda of Japan, the concessions which have been wrested from China by foreigners, the unauthorized establishment of industries in China by Japanese, all contribute to

the unrest which prevails from Peking to Canton. There is also the specter of a reestablished monarchy, which has to be continually watched. The keynote of recent speeches that were made in Peking by cabinet ministers was without exception the dependence of China for protection upon the United States. These speeches made by Marshal Tuan, the Premier, the minister of foreign affairs, and the minister of marine all amounted to a plea, almost pathetic in tone, to the United States for counsel and protection; for America is the only nation that they can implicitly trust and regard as disinterested. This is natural, for the United States stands before China with clean hands. America not only wants nothing, but even refuses to take that which China has gratuitously offered her.

The Chinese, of course, hope that Shantung will not be made an exception to the open-door policy, and they hope for tangible aid from the United States on this question.

The charge is frequently made that many high officials in China are pro-Japanese, are in the pay of Japanese, and that the public offices are honeycombed with Japanese spies. It is a fact that Gen. Hsu—"Little Hsu"—commanding the northwest frontier defense force, has employed a Japanese colonel as instructor, an act which has excited comment, especially as it is believed that Gen. Hsu will be the successor to Premier Chin-Yen-Peng as premier and minister of war.

The central Government is bankrupt, having no money to carry on the daily expenses of the Government except that which can be raised by foreign loans. American bankers are ready to supply funds, but Japan blocks the way, as she wants to hold her influence by being the only creditor. In two years the Japanese banks have advanced more than $300,000,000. The troops which are supposed to be paid by the central Government are in arrears. Likin taxes and other taxes are collected by the Tuchuns. Those of the northern faction remit in some cases a small amount to Peking, and in other cases none at all. In one Province a tax on salt alone produces a revenue of over a million dollars a month, which is collected by the foreigners and handed over to the Tuchuns.

The President, Hsu Shih-chang, is held in high esteem and is generally favorably considered. He is interested in the development of China, particularly agriculture, and is a man of education and culture. He hopes for better and closer relations with the United States, and a clearer understanding between the two nations.

Each Tuchun keeps his own force supplied with war material, but all are lacking in artillery and the essentials for carrying on a foreign war. Food abounds. The southern faction has not enough war material to carry on war with the north.

Custom duties are limited by international agreement to 5 per cent ad valorem and can not be increased without the consent of foreign powers. Custom duties and the salt tax are collected by foreigners employed by the Chinese Government. Most of these taxes are remitted to the central Government at Peking, but are hypothecated to pay the Boxer indemnity and the interest on foreign loans.

The real awakening of China will come from the so-called student movement, which comprises many allied societies. It is the getting together of the educated element who are not in office to eradicate the corruption of the official classes, and to fight to a finish the increasing power and influence of the Japanese. These students are imbued with the true spirit of patriotism, but they are a small minority with pronounced Bolshevik tendencies of a moderate nature. They have the sympathy and support of the missionaries. The activities of the Y. M. C. A. in this field in China have not been viewed favorably by Japan.

America has missed many opportunities in China, but it is not yet too late for her to establish a dominating influence. This applies especially to the present opportunity of giving assistance to our manufacturers in their efforts to introduce American goods and output. It is thought that the Chinese desire our influence, both in the army and navy; they want American officers as instructors in both services. They desire to send their young men to Annapolis. In the Navy Club at Peking there is a beautiful model of a British cruiser. These things mean much to a people who are naturally gracious, thoughtful, and courteous, and who are particularly susceptible to attention and kindness shown to them.

The central Government in Peking is endeavoring to patch up an agreement with the southern faction in order to present an external appearance of unity, and when this is done they will probably attempt to secure from foreign nations loans to develop the country.

The people of China, as represented by the students and the small minority sufficiently informed to take any interest in the Government, hope to eliminate the official class, and to establish a real republic in which the power of the people will be supreme. This can not be done, however, until the masses are sufficiently educated to understand what government is, and how it may be obtained. The first step in this direction would be to improve communication and extend the press throughout the land, and inaugurate compulsory school attendance in order that knowledge may be disseminated.

It has been said that China can never establish herself as a self-sustaining nation until her political leaders become imbued with the realization that a public office is a public trust. A long time will, of course, be required for this transition. The process is vitally connected with American educational institutions in China, as they form the principal means of developing ethical ideas in China itself. For

this reason American schools will have an important influence on China's political future.

Chinese forces.

Northern troops	425,000
Southern troops	300,000
In Manchuria	60,000
In Siberia	3,000
	788,000

Siberia.

Population east of Baikal	3,000,000
Total population of Siberia	12,000,000

At this writing Siberia is a storm area and it is in Siberia that the future of Russia, Japan, China, and Germany will be settled. Since the withdrawal of the European Allies the field has been left to the advancing Bolsheviks on one side and the Russian people on the other, with the Czecho-Slovaks, Japanese, and Americans as guardians of the railroad.

The recent spectacular successes of the Bolsheviks have been principally due to their numerous and able, military leaders who were in the Russian Army of the old régime. Gen. Brusilov, former commander in chief of the western army which withstood the attack of the Germans in the early days of the war, is now said to be attached to the Soviet general staff; Gen. Everts, who is now reported in command of the eastern Soviet forces, was prominent in the old Russian Army. With a vanguard of about 20,000 men he has already reached Nizi Udinsk, and is expected shortly at Irkutsk.

Since the complete collapse of the Kolchak government, Ataman Semenoff has proclaimed himself supreme ruler, and has under his command about 3,000 men, half of them being a portion of Kolchak's demoralized troops, Buriats, Mongols, etc. It is recently reported that he has fallen and is under arrest.

Gen. Rozanoff at Vladivostok was overthrown on 31 January by a mixture of all parties—Bolsheviks, Partisans, Social Revolutionists, etc., who have jointly and unanimously selected the Zemstvo to establish a new government.

Ataman Kalmikoff, at Habarovsk, who has had the support of the Japanese, has had a precarious position for some time in the wake of the revolutionary movement which has swept from Vladivostok to Nikolsk.

The manifest intention of the radical element in Bolshevik Russia is to spread Bolshevism over the world and destroy all governments and to substitute therefor communism. Their agents are at work in every country, including China. It is stated that the communists had a membership of 314,000. The fall of Kolchak has brought the frontiers of Bolshevik Russia into contact with Mongolia, thereby opening a direct route into China and Turkestan to the borders of

India, but it is probable that Bolshevism will be introduced into these countries by propaganda and not by soldiers. Lenin has recently declared that his theory was being spread in all oriental countries. Large numbers of Chinese are in Bolshevik employ in Russia proper. There are about 30,000 Chinese soldiers in Trotsky's army. Unless Japan makes a favorable agreement with the Bolsheviks within a short time, due to the collapse of Denikin and their opponents in European Russia, the full military strength of Bolshevism may be diverted to Siberia and a critical situation created for Japan and India. Japan and Great Britain thus have a vital interest in the outcome of the Siberian situation. If the Bolsheviks overrun eastern Siberia and China, their teaching will be brought to the Sea of Japan and the security of the empire threatened. Until this situation clears Japan will not have much time to devote to China.

Considering recent developments in Siberia, it appears that in many respects revolutionary Siberia will prove to be an ally of the United States in the Far East instead of one of the opposing forces. Should the government finally established be worthy of recognition, it would prove an important feature in checking Japan, because the imperialistic ambitions of Russia were fostered by the military and monarchistic elements, but all that Russia now wants in Siberia is to get back her original territory, and to be free from foreign intervention.

The overthrow of the Romanoff régime at Vladivostok, and the occupation of the city by the revolutionists marks the extreme advance of their movements in eastern Siberia, and leaves of the remnants of the Russian army in Siberia only the reduced forces of Semenoff and Kalmikoff. It seems certain now that only a short time will elapse before the Reds are in control of Moscow to the Pacific.

There are now operating in eastern Siberia the following principal political parties: Bolsheviks, Partisans, and Social Revolutionists. They are now in complete power from Nikolsk to Vladivostok, and have decided to back the Zemstvos in establishing a form of government which they believe will appeal to the people and the Allies more readily than Sovietism.

The Social Revolutionists desire to bring about a form of government that would include the establishment of a constituent assembly, universal suffrage and the rights of private property. Their principles do not materially differ from those now laid down by the Zemstvos. The latter are temporary government councils found in provinces, cities, and districts. Formerly they had more of an economic status as a connecting link between the Czar's government and the peasants. Now they have assumed a political aspect in being used for governing purposes.

The Partisans, though designated by many as "Bolsheviks," do not represent the Lenin-Trotski quality of Bolshevism, but are the peasants whose ideal is the attainment of land and freedom. They have no inherent interest in Bolshevism, Sovietism or Communism; they only wish to be unmolested, and permitted to cultivate their farms, but oppressed as they have been and having no organization, they yield easily to the teachings of the Soviet-Bolshevik leaders.

All of these parties have joined hands in the revolutionary territory between Nikolsk and Vladivostok and have given their support to the Zemstvo, temporarily wiping out party lines.

There is much speculation as to the stability of the new government, owing to the diversity of political elements, which for the time being are supporting the Zemstvo. Cohesion to-day may dissolve over night when the Bolshevik element recovers from its present exultation, and realizes that its strength may make it possible to absorb the Zemstvo. The Bolsheviks realize, however, that if their soviet rule is forced into power that opposition from the Japanese might result in war. Also there would be serious confusion in the evacuation of the Americans and Czechs. For the sake of order the Bolsheviks will, from present appearances, support the Zemstvos until after that time.

Forces in Siberia and Russia.

Japanese forces in Siberia	57,000
Chinese forces in Siberia	3,000
Partisan forces in Siberia	40,000
Bolshevik forces in Russia	500,000
Russians opposing the Bolsheviks, in Russia	100,000
Russians opposing the Bolshevik, in Siberia	4,000
Czech troops in Siberia	38,000
Czech troops mobilized from Siberian prisoners	22,000

NOTES ON THE NEAR EAST.

Source: Reliable.

(7429-E.)

17 March, 1920.

It is learned that the British are for the first time endeavoring to fight Bolshevik agitation in the Near East by the use of counterpropaganda. The authorities have discovered an Englishman, one who has been a Moslem student for some years in Egypt and who is thoroughly familiar with life out there and is willing to direct a campaign in this regard. He has agreed to write counterpropaganda treatises and to undertake certain underground operations. If the plans succeed it may be extended to other eastern countries under the immediate direction of a British officer in Egypt. He will be personally responsible to the director of the intelligence service in London. Great things are expected from this project and it will be interesting to see how it works out.

In addition, the situation in India is giving the British increased alarm. The agitation, like the revolutionary movements in other countries, if not actually directed from Moscow, has close soviet connections. The British authorities can not understand the success of the Communist propaganda, since it teaches an atheistic creed directly opposed to the Hindu and Mohammedan beliefs. Various reports have reached England regarding the presence here of a group of Indian revolutionaries working for autonomy and eventual independence. It seems very probable that this group will have connections with the Bolsheviki.

GERMAN IMMIGRATION.

Source: Reliable.

(12292.)

29 December, 1919.

Since the signing of the armistice there have arrived in Argentina approximately 9,000 German immigrants. In addition to this number, 1,200 Germans are now due on the Dutch steamer *Holandia*, Royal Holland Lloyd, which will arrive during the first part of January, 1920. These numbers include only the steerage passengers brought to Argentina on vessels and does not take into account second and first class passengers. It is stated that some 50,000 Germans are desirous to come to Argentina and have applied to the Argentine Legation in Berlin to date. Transportation is found to be a difficult problem, and only 1,000 to 1,400 can be accommodated on each vessel.

Christmas eve night a celebration was held in the Casa de Imigracion (Immigration House), an Argentine Government institution, in honor of the German immigration to the Argentine. This Christmas celebration was given by the German Club to German immigrants. There were talks by Dr. Luppo, director of the Casa de Imigracion, and Director E. Hayn, of the German Electric Light Co. of Buenos Aires. Opportunites of the Germans in Argentina were discussed and many yells from the crowds praised Irigoyne, President of the Argentine Republic, proclaiming him to be a friend of Germany.

In order to promote German immigration in Argentina, the German Club in Buenos Aires has financed the publication of a book in German entitled "Argentine of To-day." This book is authorized by the President of Argentina and will be utilized for the attracting of German immigrants. It will be sent to Germany for distribution. The front cover of the book reads:

Argentinien von heute (Argentine of today); Schilderung von Land und Leute (explanation of land and people). von (By) Leo Mirau. 2. Auflage (2d edition). Argent. Wappen (Argentine seal). 1919. Librería Mirau (Mirau Book Store), Av. Cramer, 1913, Buenos Aires.

AVIATION.

ROYAL AIR FORCE EXPERIMENTAL STATION AT THE ISLE OF GRAIN.

Source: Reliable.

(6736)

10 February, 1920.

The royal air force experimental station, Isle of Grain, is located at the mouth of the Thames. It consists of about 25 large hangars, any one of which could easily accommodate two or three large machines of the *D.H–10* type, or flying boats of the *H–16* type.

The organization is divided now into three departments, with a major of the royal air force in command of each department. There are—

(1) Test.
(2) Armament.
(3) Experimental construction.

Attached to each of these departments is an adjutant and also the necessary number of engineer officers. Before the station was taken over by the royal air force and while it was still under the navy, it was not found necessary to have an adjutant in each department, as one executive officer handled all of the work.

It is said that no work of any importance is being done at the present time. The work during the war and what little is going on now has been entirely for the navy. Up to a short time ago the personnel amounted to 1,200, but at the present time there are only 200 men on duty.

Very little planning is done at the station, as this work is taken care of by the London central office, where ideas of officers and civilians are received and checked. If a machine is offered to the royal air force, the drawings are first sent to the London office and a record of the factory test is also checked there. If it is felt that the machine is worth a further testing, the machine itself is sent to Grain, where it is put through a practical flying test, after which it is turned over to the experimental construction department, in order that a study may be made of it in the event of changes in the design being found necessary. Under no circumstances are factory tests accepted as final, and all machines are sent to Grain for trials.

In addition to the work done on machines which have been completed at factories, a great deal of experimental work was carried out

on types which had been designed by officers of the naval air service, and many of the ideas which have been adopted for use on naval air craft were worked out by the engineering officers on this station. The only new machine under way is one called the *Griffin*, which will be a two-seater designed for work with the fleet and for launching and landing upon the decks of seaplane carriers. There is nothing extraordinary in the design of this machine, and it will simply be a fast reconnaissance type. It has, however, an extra large cockpit for the observer, allowing plenty of room for telephone, radio, or any other outfit which may be considered necessary.

In regard to the work with the navy, it is not considered that seaplanes are of much use except the large *F* boat type, or those similar to the United States *NC* type. The tests which have been made with land machines equipped with air bags and hydrovanes have been found entirely satisfactory, and a machine can be landed a number of times on the water without serious damage. In fact, one machine was landed 12 times before any overhauls were made at all. At first it was considered necessary to take the motors out for cleaning after having been in the water, but recent practice has been to give the motors a bath in kerosene oil after they have been brought ashore and started running in order to warm them up and dry them out. It is believed that all of this work was done with rotary motors, as all of the machines seen in the moving pictures were equipped that way. It is not known whether experiments were made with stationary motors.

The only recommendations the officers had to make in regard to the use of small seaplanes were that they should be used for practice purposes in order to instruct the pilots who had been trained in land machines how to land properly on the sea. After a few landings, it would not be difficult for them to land with an aeroplane, equipped with air bags, on the water. Formerly these air bags were fitted on the lower plane transversely to the fore and aft line of the machine, but it was found that in this position there was too much head resistance and a tendency to cause the machine to dive, due to the lowering of the center of pressure. In the latest types, the bags are fitted attached to the fuselage and landing gear in a fore and aft position and in this manner work satisfactorily. The machine must, of course, be equipped with a forward hydrovane. Experiments were tried with tail hydrovanes and found satisfactory, but are not absolutely essential. It is the practice just before making a landing to drop the wheels from the machine, as the resistance caused by the wheels striking the water tended to offset the action of the hydrovanes, causing the machine to go over on its nose.

It is said that a certain number of single-seater fighting machines should be carried aboard a ship in order to protect it against enemy

aircraft, but that for general service a single seater was of very little use; experiments are, therefore, being made on the two-seater Griffin type. As it has been found impracticable to launch seaplanes easily from the decks of vessels without using catapult devices, it is not considered advisable to carry them aboard a ship, as the lowering of these seaplanes into the water by means of cranes necessitates the stopping of the ship which, of course, is always dangerous owing to the liability of attack from submarines.

Some very interesting moving pictures were shown of the work done aboard the *Furious* and the *Argus* and the difficulties which were found in making landings when the ships were traveling at full speed. In a number of pictures the machines were badly crashed, and in others the air currents made it absolutely impossible for the machine to land on deck. This was especially so aboard the *Furious* owing to the bad air currents which were set up by the funnels, mast and bridge, as well as other gear on the superstructure. Landings aboard the *Argus* were much easier to make owing to the clear deck and the absence of obstructions which might set up air eddies. There was no difficulty at all in landing machines aboard when the ships were at anchor with the exception of higher landing speed. This speed would make but very little difference, however, if the trap in which the machines are brought to rest were constructed properly, and the pilot landed far enough astern to lose speed before entering the wires.

Moving pictures were shown of the British smoke bombs, both of the phosphorous and of the stannic chloride types. It is said that these bombs are quite satisfactory, and are designed for use when attacking enemy naval vessels with torpedo planes. The system would be for two or three planes to form a smoke barrage around the vessel attacked, keeping the barrage about a half mile from the ship. When the smoke from the bombs had joined together, forming a complete barrage, a torpedo plane could easily attack, without being fired upon, by coming up behind the screen, diving through, launching its torpedo and returning into the smoke. As the smoke holds for a long time there would be every opportunity for the plane to get out of range of antiaircraft guns.

Pictures were also shown of the launchings of Short type seaplanes from catapults, but as these launchings were practically the same as those which have been carried out in the States from our own ships, there was nothing to be learned from them.

One of the large F type boats was equipped with a spar about 10 or 12 feet long, which is to be used in night flying or in fog when the machine is about to make a landing. One end of this spar is connected with the elevating controls of the machine, and the other

end is lowered so that it hangs several feet below the keel of the machine. As soon as this end strikes the water, the force raises it, and the controls are automatically brought back into an up-flipper position, warning the pilot as to his exact distance from the sea. We were informed that this had worked satisfactorily, but had not been put into general practice. This same machine was equipped with an air-driven Servo motor, which consisted of one large central gear and two gears to the right and the left which were connected with the ailerons. If the pilot turned his wheel to the right, the central wheel would shift to the small wheel connecting with the left aileron, and the power generated by the air propeller would assist in operating the controls. This system, of course, worked in the same manner when the wheel was turned to the left, the central wheel connecting them with the right gear.

One of the F boats was being used for experiment with gun mountings, and a number of small cockpits for gunners had been placed in various positions in order to determine the best location for the gunner when firing over the tail. On the machine in question the cockpit had been placed to the rear just above the left hand motor, the floor of the cockpit resting on the engine bearers which had been extended for the purpose. The position was found to be satisfactory but, owing to the tremendous amount of pressure over the top plane, the work was made very difficult for the observer, and we were informed that the best position would be to place gun mounting cockpit on trailing edge of the wing just to the rear of the center wing strut.

Pictures were also shown of parachutes being tested with sand bags and also one test with an officer making the jump from a *DH–10* type machine. In all of these tests the parachutes were stored in a small compartment in the underside of the fuselage and connected by a line to the harness of the man making the jump. This system works out quite well, but there is always the danger of the parachute catching on some part of the machine, in the event of its being in a spin, and ripping, and the German system of having the parachute attached directly to the pilot observer, that is, strapped on his back, is considered to be the best.

A number of various types of hydrovanes were shown, and the pictures of the experiments made with these gave a clear idea of how the various types worked. After a great many experiments had been made, it was found that the hydrovane built in a slight V-shape and set at a 4° incidence to the fuselage was the most satisfactory. Some of the vanes are made of wood; a great number had been made from Monel metal.

Regarding the shops for repairs and construction, there were but few small buildings built for this purpose. Practically all of the

work is done in the hangars. Each hangar is built with wings on either side, and these wings are fully equipped with the necessary machine tools for metal work, and a number of them have been fixed up for wood-working departments. No work was being done in any of these while we were on the station.

A deck, similar to those built on board the seaplane carriers, had been built on the grounds, and this had been equipped with wire traps for experimental purposes. As it is extremely difficult, however, to get the same conditions as are met with aboard ship when a ship is underway, this had not been very useful and we were advised not to build one, but to carry out all experiments on board ship.

The officers with whom we spoke were very emphatic in their remarks about the royal air force, and stated that since the station had been taken over by the air force the quality of the perononel had fallen off considerably and that a great deal of difficulty has been experienced in obtaining material. When the station was operated by the R. N. A. S., the personnel was drawn from the navy, and the best fitters and motor men had been supplied; consequently the work had gone on very rapidly. When certain materials were needed, it was very easy to obtain whatever was necessary by merely applying to the arsenal at Sheerness, where practically all material required for the construction of planes was kept. The arsenal was also well equipped with shops, and any work that could not be done on the station at Grain was sent to the arsenal and done there by the personnel attached at that place.

Col. Busteed said that there were some good points about the royal air force, one of which was that previous competitive bidding of the two services had been stopped after the organization of the air force, and the starting of a material air board. It is said that a number of regular navy officers, who had been in the R. N. A. S., had refused to join up with the royal air force and had left aeronautics and returned to their duties aboard ship.

The experiments on the station were previously carried on under the supervision of the commander in chief of the fleet, and had always been with the object of keeping in close touch with the navy's needs, but we were informed that at the present time that there is no direct communication with the commander in chief, and that orders for experimental work were received from London. As these came through the royal air force headquarters, where a great many ex-army officers were in charge, they were not always for the best advantage of the service. It is said that the Handley-Page machine and the Rolls-Royce motor had both been turned down by the R. F. C., but had been taken up by the R. N. A. S. and developed to their present state of perfection by the navy. Further, practically

all of the bomb gears used by the British air forces have been worked out by naval engineers.

One reason for the lack of personnel on the station was that the majority of men who had been serving as royal air force mechanics had been demobilized after the armistice, and it is almost impossible to get men to join the service for this kind of work. It was thought that the best organization for experimental construction would be to have the plants operated by civilians and civilian workmen. In this way higher salaries would be paid and the most expert manual labor would be employed. Naturally the supervision of the work and the training would be done by the military air forces. It would also be advisable to have amongst the civilian employees ex-officers of the navy and army air forces, well qualified in aeronautic engineering, as their experience during the war as military men would be of great value in assisting in experimental construction. At the present time there are too many ground officers being appointed, and, taken altogether, the station is practically out of commission due to lack of action on the parts of the heads of the royal air force, who seem to have absolutely neglected the naval end of the work.

THE FRENCH AERONAUTICAL MISSION TO JAPAN.

Source: Reliable.

(11389.)

5 February, 1920.

Why France Sent an Aeronautical Mission to Japan.

It is through Lieut. Gen. Tanaka, who was assistant chief of staff until August, 1918, and since that time minister of war, who is responsible for Japan receiving French matériel and French instructors.

The idea of appealing to the French goes back to April, 1918. The entire conquest of Russia by the Bolsheviks and the signing of the treaty of Brest-Litovk opened to Germany a communication with Asia; the Allies, and above all France, counted upon Japan to bar the road to Germany, and perhaps later reconstruct an eastern front. Lieut. Gen. Tanaka, like the majority of the Japanese military party, was a resolute advocate for intervention in Siberia, and was eager to provide the weapons in which the Japanese Army was deficient and which the possibility of an encounter with German troops rendered more necessary than ever. In considering the subject of the military intervention of his country in accordance with French desires, he spoke to a representative of the French Army in Tokyo of the difficulties of a technical order that the execution of such a project would make manifest. "We have no aeroplanes," he said insistently; "give us aeroplanes."

We transmitted the suggestion to Paris. We then passed many difficult hours, and came very near not receiving any reply, and did

not have the satisfaction of acceding at once to Gen. Tanaka's request.

However, we pressed the question. Circumstances seemed, besides, to be more favorable. Our counteroffensive of July commenced to free us from the German pressure; in addition, the arrival of the Allies at Vladivostok was imminent, and Japan was much disturbed. The necessity of furnishing to the Allied Army upon the point of taking the field the means of aerial reconnaissance which it lacked was unquestionable. France then decided in the early part of August to furnish to the Japanese Government 30 Salmson aeroplanes and 10 balloons and attach to them the necessary personnel for their employment.

Details of this transfer were carried out by Col. Nagai, the Japanese military attaché in Paris, who dealt directly with the necessary bureaus of the War Department.

Events followed closely upon each other's heels. The Japanese intervention, together with the energetic action of the Czecho-Slovaks, rid Siberia of the Bolsheviks in a few weeks, but the collapse of the German Army and the armistice followed before the aeronautical mission had embarked.

Notwithstanding the armistice, there was no reason for countermanding the departure of the mission; Japan was only too happy to profit by an opportunity for instruction, and France, on her side, could not fail to profit by sending her aviators and machines to the Far East.

The mission left France during the latter part of November.

The negotiations carried on by Col. Nagai had resulted in a considerable development of the mission from the point of view of personnel and matériel as well, and to make of it an important mission of instruction in all branches of military aeronautics.

The Stay of the Mission and Distribution of its Members.

The mission arrived in two sections—the first about 15th of January, the second early in February.

The duration of its stay had not been fixed beforehand, as such stay would depend on the necessity of instruction and the program adopted. As a matter of fact, two-thirds of the personnel returned to France during the latter part of September

The Japanese Government requested, and obtained, permission to keep 17 officers (11 officers and 6 noncommissioned officers)—5 until 30 November, 1919, and 12 until 31 March, 1920. The latter, for the most part, were mechanicians of the motor-manufacture service The colonel, chief of mission, was also to be kept until 31st March.

Pay and Allowances.

Until 1st October the expenses of the mission (pay and allowances) were entirely defrayed by the French Government, the Japanese furnishing lodging free.

After the 1st of October officers and noncommissioned officers kept in Japan were considered as being in the Japanese service, and received from the Japanese Government their lodging and very generous allowances.

Commission for the Study of Japanese Military Aviation.

From its arrival the French Aeronautical Mission was placed in communication with a military commission, charged with arranging with the chief of the mission the details of the program to be carried out and the details of execution. Officially, the two missions were united and called "Commission for the Study of Franco-Japanese Military Aviation."

The Japanese mission consisted of 18 members, with a major general as president, 4 lieutenant colonels, 6 majors, 7 subalterns, a paymaster, and interpreter.

Its most important members were Maj. Gen. Inoue; Lieut. Cols. of Engineers Kusakari (died in March, 1919), Sugihara (since left on a mission to Germany), and Masada; Lieut. Col. of Infantry Nakamura; and Maj. Asada, artillery; Majs. Ichida and Kodama, infantry; Maj. Umedo, engineers; and Capt. Sakai, infantry.

It is necessary to mention also Maj. Gen. Arikawa, engineers, who although he did not belong to the commission, has followed the work of the mission in all its branches very closely. He is said to be the future director of Japanese military aviation. Although he was educated in Germany, he has nevertheless shown himself to be very kind to the members of the mission, and the French officers who know him say that he is competent.

Strength and Distribution of the Members of the Mission.

The total strength, after the arrival of the second section, was 52, of which 22 were officers and 30 noncommissioned officers.

They have been divided into six groups, corresponding to distinct services.

(*a*) General staff: Col. Faure, chief of mission (3 officers, 3 noncommissioned officers).

(*b*) Pilots: Maj. Le Fevre, chief (4 officers, 3 noncommissioned officers).

(*c*) Reconnaissance: Maj. Flury, chief (Capt. Van Herzoecke, instructor of wireless (5 officers and 9 noncommissioned officers).

(*d*) Bombardment and aerial fire: Capt. Perrin, chief (3 officers and 1 noncommissioned officer). This personnel has been sub-

divided into two distinct schools: Bombardment at Mikata-ga-hara, and aerial fire at Araimachi.

(*e*) Manufacture and superintendence: Maj. Josset, chief (4 officers and 6 noncommissioned officers).

(*f*) Aeronautics (aerostation): Maj. Vernes, chief (3 officers and 8 noncommissioned officers).

Reception and Treatment.

The mission has been received in a manner that has left nothing to be desired, and has been showered with kind attentions from the moment of its arrival. It has been honored by two imperial audiences. Not only has it met with a warm reception in military circles, but also in navy, political, and financial circles as well.

The reports of the services have been always proper. Each officer or noncommissioned officer has been, from a point of view of exterior marks of respect, accorded treatment appropriate to his grade.

General Staff.

Col. Faure, chief of the mission, has had not only to direct the different services of the mission from the technical side, but has had to instruct the Japanese general staff on the subject of the employment of aviation in an army.

The instruction given by Col. Faure has been condensed into two documents which will doubtless serve as a basis for the subject of aviation in the Japanese Army. These are: First, ten Conferences upon French Military Aviation, delivered at the Staff College, Tokyo; second, An Aviation Staff Officer's Voyage (résumé and information drawn from aviation general staff exercises carried out in August, 1919, in the vicinity of Tokyo).

Capt. Sakai of the general staff has assisted Col. Faure by the translation of these documents.

Col. Faure has insisted very much upon the creation of an aeronautical head, which will doubtless take place in the near future. In the meantime, a bureau of aeronautics has been organized in the war department.

Pilots (Kagami-ga-hara):

The following remark applies to all the schools. The actual command has never been turned over to the French officers. It has always been exercised by a Japanese who has transmitted to his subordinates the orders and desires of the French instructor, and seen, generally with care, that the orders were executed. A certain number of officer-interpreters of French were also attached to the school.

The school was organized at Kagami-ga-hara, near Gefu.

Col. Sugiyama, commanding the Second Aero Battalion, has all the schools in that vicinity under his charge. Properly speaking, the pilot's school was under the command of Maj. Takahashi. French instructors: Maj. Le Fevre, chief, with Lieuts. Kergorley and Deckert as principal assistants. The latter rapidly became very popular in Japan.

The mission of the school was to transform pilots of slow and rapid machines to pilots of combat and pilots of reconnaissance and bombardment.

All the "Dressage" had been made exclusively by day with the "Monomoteur."

There have been 33 pupils, in two series (5 of these pupils belonged to the navy). The first series, 20 pupils for a course of 6 months (this unusual length has been caused by scarcity of machines). The second series, 13 pupils for a 3 months' course.

All these pupils have been licensed on the *Framan*, having practiced aviation varying from 6 months to 3 years. All were 30 years and over.

1. School of transformation (length, 6 weeks). *Nieuport* and *Morane* "Roulours" *Nieuport* 28 m. 2 i, double command. *Nieuport* 23 m., 2 D. C.; *Nieuport* 23 m., 2 single; *Nieuport* 18 m., 2 single.
2. School of specialization (length, 6 weeks). Pilots de combat: Aerobatic work upon monoplanes (*Nieuport* 15 m. 2). Pilots of bombardment and reconnaissance: Work upon biplane (*Nieuport* 18 m. 2). All instruction has been given on the *Nieuport*, and this machine, according to Maj. LeFevre, has the confidence of the pupils.

The specialists of the second category (bombardment and reconnaissance) have had instruction in the first series with the Sopwith biplane and in the second series in the Salmson (this latter at Tokorozawa).

Results Obtained.

Of the 33 pupils, 1 has been killed and 5 others were eliminated for incompetency. It is to be noted that there was but one fatal accident in 1,200 hours of flight; their ability is inferior to the French.

They were classified, 27 pilots of whom 16 were combat pilots, and 11 pilots of reconnaissance and bombardment. Of the 16 combat pilots, 2 are very good and 6 are good. These pilots who have finished the advanced course at Kagami-ga-hara will constitute without doubt the future instructors of Japanese schools for pilots.

Aviation of Reconnaissance (Yotsukaido School).

This school was organized at Yotsukaido, near Chiba, upon an artillery firing field, which is admirably adapted to maneuvers of the three arms.

The commanding officer of the school was Maj. Asaka, of the general staff, and officer of the artillery, who had studied aviation.

French instructors: Maj. Flury, Capt. Herzaecke, and others already named.

Organization of Courses and Their Duration.

1. Course for instructions. Number of pupils, 15; duration of the course, 4 weeks. The instructor students were selected from officers of all arms, generally captains, two thirds belonging to the Artillery, of whom 50 per cent were general staff officers (brevet).
2. Course for students. Number of pupils, 37; duration of course, 6 weeks. The officers (37) were divided as follows: 20 officers (two-thirds artillery and 40 per cent general staff); 2 captains, engineers, 15 noncommissioned officers, specialists in photography and wireless.

After obtaining their brevet, whether as observers or specialists, they return to their former regiments. They may be recalled if necessary to the photographic and wireless sections. With reference to wireless, a definite solution had not been adopted in October, 1919, the engineers and aeronautical section quarreling over the privilege.

Course of information and employment for officers of all arms.—This course, organized by Maj. Flury, consisted of three successive series, each of 8 days' duration.

First series, 43 officers selected from each regiment of artillery.

Second series, 70 officers selected from each regiment of infantry, including Manchuria and Formosa.

Third series, officers of cavalry and general staff.

Matériel and Course of Study.

Matériel and course of study were those we employ in France, notably the observation tower and the relief map with numerous points of impact subject to the will of the director of the exercise.

Observations in actual flight were made in the Japanese Farman, 100 horsepower, 90 kilometers per hour; the school had 10 of each such machines.

One Spad, 220 horsepower, arrived at the school just at the close of the course.

Japan has not yet developed pilots for rapid machines, and the school of observation had to use slow machines.

Future of the school: It is said that the school will be definitely located at Yotsikaido. It is a question of increasing the field by buying some neighboring ground.

School of Aerial Fire (Araimachi).

The school of aerial fire has been located at Araimachi upon Lake Hamanako. The lake, or more exactly, the lagoon of Hamanako, situated about 10 kilometers west of Hamamatsu, affords a field of fire about 9 kilometers long 7 kilometers wide. Lamer, in the vicinity, can also serve as a field of fire.

Pupils and Length of Course.

1. Course of machine-gun students: Number of students, 9 (of which 2 belong to the navy). All were already pilots. Length of course, 3 months. The time has, for causes which will be indicated later, exceeded by at least one-third the time estimated in advance.
2. Course for observers: This was provided for in the first program, but had to be abandoned on account of the excessive length of the preceding course.

Methods and Instruction Equipment.

The instruction of machine-gun students has been made upon hydrobiplanes, loaned by the navy department (Maurice Farman, Benz motor, 100 horsepower, and Tellier, motor Hispane-Suiza, 190 horsepower).

The instruction of the pilots de chasse students has been the Nieuport monoplane or biplane, belonging to the neighboring aviation field, at Mikatagahara.

The methods and instruction equipment were naturally those employed in France: Sighting apparatus, callimateurs, railroad apparatus, "Cibles Locustres," "Tirs sur Mauches," etc.

The machine guns used were either the Lewis, the Japanese 1914 model, or the Vickers.

The school of fire will not be kept at Araimachi, as it is too small and the region too thickly populated. There was some talk of moving it to Yamata, in the Ise Province, but this ground belongs to the navy.

School of Bombardment (Mikatagahara).

This school was installed on the waste land at Mikatagahara, about 6 kilometers north of Hamanatsu. This ground makes a good aviation field, and a portion of it has been fixed very satisfactorily for a field of bombardment.

The school, like that of aerial fire, is under the command of Maj. Akabane.

French Instructor: Lieut. Vaurin and others.

Pupils and duration of course.—First series: Two pilots, 4 bombardiers; duration, 2 months. Second series: Six pilots (1 navy), 6 bombardiers (1 navy).

Methods and instruction apparatus.—The pupils of the first series all had their brevet as pilots, and a certain amount of experience, the two pilots of this series had already flown on the Russian front.

Instruction has been given on the Sopwith biplane, motor 130-horsepower Clerget, each apparatus could launch 5 bombs of 10 kilograms. Demonstrations have been made with Breguet, 400-horsepower Liberty, 32 bombs of 10 kilograms.

There has been instruction in night bombing. Methods and French apparatus: "Tapis roulant, viseur S. T. A. E., chronographe Zenith a retour, chambre noir, etc."

Manufacture and Superintendence.

The service was nominally directed by high Japanese officers, the members of the French mission playing the rôle of instructors or experts.

The establishment of the entire plan and its execution down to the smallest details, was the work of the French personnel.

This service had for its object, the manufacture in turn of the Salmson plane and the Salmson motor (Z. 9) 250 horsepower.

The service has been divided into two distinct branches:

First, manufacture of plane, and

Second, manufacture of motor.

Manufacture of the plane.—Workshops were installed at Tokorozawa

The director was Col. Matsuda, engineers, who was formerly in Germany. Number of workmen, 450. The personnel of the French mission taught them the methods and process of the work in detail. Wood and silk are abundant in Japan, and are of good quality.

The product ("rendement") of the workmen, notwithstanding excellent tools and an installation that left nothing to be desired is much inferior to that of the French workmen. However that may be, one can estimate that at the end of 1919, Tokorozawa will be able to furnish one and one-half planes per day.

Manufacture of motor.—The workshops are installed at Atsude, on the outskirts of Nagoya, in an annex to the arsenal.

The director was Col. Sasamoto, engineers, who was for some time in the Creusot works before the war.

There were 80 workmen.

The personnel of the French mission taught them the work and processes in detail.

The material is good, the necessary steels (nickel-chrome-tungsten) being furnished by the marine arsenal at Kure or the civilian factory at Omori, the director of which, Mr. Watanabe, has studied the question of special steel in Germany,

It may be estimated that by the end of 1919, the machines and personnel will be able to produce one motor per day.

Future organizations of manufacture.—The foregoing organization is not definite. Nagoya has large works that when finished will make the city the center of production of Japan's aviation in planes and motors.

In that case, Tokorozawa will only be a repair shop, and a place of assembly of aeroplanes manufactured by private concerns.

Such is at least the gist of the recommendations made by the French mission.

Balloons.

Maj. Verne, chief of service, has instructed a "compagnie type" of balloonists.

The Japanese Government has bought from France seven complete balloons with "tréuils" and three balloons "de rechange" without "reuils." To this must be added the material, complete, of a balloon company.

The balloon bought is the balloon *M* (model of Maj. Cacaut).

The Japanese project contemplates the creation of 3 companies of balloonists.

Present State of Japanese Aviation—Personnel and Matériel.

Japan has at present from 100 to 120 military pilots. One-fourth (about 30) perhaps, can be considered fairly good pilots; and of these 30, 5 or 6 only could hold their place in a squadron of good occidental pilots.

It has already been noted that 22 military pilots had completed successfully the "Ecole de perfectionnement de pilotage" of the French mission; 9, the school of aerial fire; 7 of the school of bombardment. The mission has trained, besides 9 bombers of the land forces, 15 instructors of aerial reconnaissance, 37 observers or specialists (wireless and photography). Finally the "cours d'information" has started 173 officers of all arms in the principles of aerial observation.

The principles enunciated by the French mission in matters of instruction and training of personnel will be actually put into practice after its departure.

At the same time, the school at Tokorozawa, which has been in existence for several years, and which will doubtless continue to train "eleves pilotes" drawn from the service at large, will have much trouble in ridding itself of the bad habits acquired before the arrival of the French mission.

Notably, they have been accustomed to select too old pupils, to give them all exactly the same course of instruction, and finally to send them back to their original regiments after they had once obtained the title of pilot.

The advanced schools and school of specialists organized by the French mission will be continued. The schools for combat pilots and aerial observation will continue at the same location. Those for aerial fire and bombardment will probably be transferred to a new locality—not yet determined.

Instruction Matériel Bought in France, or Brought by the French Mission.

1. Training planes (Avions-ecoles): Forty Nieuport type training, Rhone motor, 80 horsepower, and add the "rouleurs" Morane and Nieuport.

2. Matériel of aerial reconnaissance school: Observation tower constructed after French plans. Plan in relief with points of luminous contact, made electrically.

3. Photography: One laboratory carriage ("Voiture laboratoire"), model 1916, Berlier. A series of photographic apparatus as used in French aviation and includes the automatic Aubry for the monoplane.

4. Wireless: The whole series of K. V. Y. and S. alternators (the latter alternator S. for the navy, sustained wave "portant à 250 kilometers").

5. School of aerial fire: Reille Soult line of sight, Norman sight, "Collimatuer Chretieu," "grille Taillefer," G. R. apparatus, aero targets, "appareil de umelage Lewis."

School of bombardment: "Tapis roulant" and instrument of precision; "viseur S. T. A. E., Chronograph Zenith a vetour," black chamber French model, object glass, "Anastygmat," permitting operation up to 2,000 to 2,500 meters. "Pistolet a fusee metronome" for luminous signals. Michelin "bombes esclairante" Gros-Andrand Lance bombes, etc.

Foreign Matériel of Which Japan has Received Models and Which May be Experimented with.

French: Two Breguet, motor, 400 horsepower, Liberty, speed 200 kilometers, throwing 32 bombs of 10 kilograms.

Italians: S. V. A. (Avions de Chasse); Caproni (Avions de bombardment) F. I. A. T. motor.

German: L. V. G. Benz motor, 300 horsepower.

N. B. Military planes are all that are mentioned here. Civilian aviation has American models (Curtiss *J. N.–4*, Hall-Scott motor, 200 horsepower) and it is said an English model, the Handley-Page.

War Matériel Bought by Japan or that May be Constructed by Japan.

1. France, reconnaissance planes, 30 Salmson chasse planes, 100 spads.

2. England, Sopwith, Sopwith biplane (130 horsepower Clerget motor). Sopwith monoplane (80 horsepower Rhone motor).

The number of Sopwiths bought is not known. It is said to be 100.

3. Italy: The Japanese mission in Italy has brought back some S. V. A.'s and Caproni's but the number is unknown.

2. Matériel that Japan can Manufacture.

1. Matériel manufactured at present in Nagoya. Japan has been making at Nagoya the Maurice Farman biplane (Deimler motor, 120 to 150 horsepower). The capacity of production is unknown, but at present it is certainly very small.

2. Matériel which can eventually be manufactured at the factories at Nagoya: The manufacture at Nagoya when finished will bear comparison with the best French factories, as extensive and as well arranged. These works will equal nearly half of our great factory Payen d'Aubervilliers. They contain already 400 American machines of the latest model. A half of these machines are suitable for making the Salmson motor. The other half will make a more powerful motor, just which it is is not known, and it is probable that the Japanese have not yet decided. These new machines for manufacture of motors will probably be finished in March, 1920. It is too early to state just what will be the capacity of production, as the workshops for the construction of "planeurs" (planes?) have not yet been commenced.

3. Matériel that civilian firms can eventually manufacture: Civilian firms can make in small quantities the Nakajima, Ito, and Fujiwara planes of Japanese construction, and imitation of certain American motors (Hall-Scott).

The factory at Otomachi (Guma Prefecture), in the suburbs of Tokyo, makes the Nakajima plane (Hall-Scott motor, 100 to 150 horsepower). Capacity of production five planes per month.

The Japanese aviation uses at present three machine guns.

The Japanese machine gun, model 1919 (said to be a kind of Hotchkiss), is the one that has been employed so far. It is very imperfect; the system of loading only allows

100 cartridges to be carried. This model will be abandoned and will be replaced by another type now under investigation.

The English machine gun, the Lewis: In October, 1919, they had 15 of these guns. It is possible that they may adopt this type in the future, contenting themselves by disguising it.

The Vickers machine gun is the only type which permits of synchronization with the motor, and is an excellent type for avions de chasse. In October, 1919, the Japanese had two or three of them. It is said that the Japanese have at present a new Vickers in course of construction in the factory at Otamachi.

The bombs used in Japanese aviation are the artillery shell, provided with "un percuteur a l'arriere et d'ailettes de fortune, qui part la suite ont ete fuselees." It contains 10 kilograms of explosive. The Japanese have also in their possession specimens of the Michelin "eclairante" bomb and the G–A lance bomb.

AVIATION, TURKEY.

Source: Reliable.

(7433.)

22 February, 1920.

There are 9 flying squadrons attached to army corps and a general depot for aircraft material in Constantinople.

Each squadron consists of 6 aeroplanes—reconnaissance and fighting machines.

Officers of the rank of lieutenant and captain belonging to the infantry, cavalry, and artillery are, after a suitable medical examination, eligible as pilots or observers. As necessity arises noncommissioned officers are selected only as pilots. Observer officers are taught thoroughly the handling of the machine gun, therefore there was no separate personnel for this.

There are two classes of air mechanics: Permanent, who rank as underofficer and are all long-service men, and temporary, who are selected from army recruits and only serve for the usual period of their military service.

During the war whenever the number of squadrons in an army exceeded 2, they were put under command of a separate officer, but in peace time this was not the case.

In every army corps there is a flying squadron. These squadrons are, for technical matters, under the command of the inspector general of aircraft, but for tactics and administration they come under the command of the army or army corps to which they are attached. As there is not at present sufficient hangar accommodation, the flying squadrons are stationed near the aerodromes and are under the aerodrome command.

After the signing of the armistice there were 7 squadrons, of which 5 had lost their fighting capacity, and 2 captive-balloon detachments.

The Turkish air force reached its greatest strength in May, 1918, when it consisted of 17 squadrons with 134 machines (excluding machines in depots).

During the war balloon attachments at first consisted of three detachments, but one was afterwards disbanded and divided between the remaining two.

AVIATION NOTES.

Source: Reliable.

(12785-A.)

13 March, 1920.

Civilian aviation in the United States has been limited practically to the Aerial Mail Service and the forest-fire patrol carried on by the Government. England, France, Italy, Japan, and Germany have either appropriated funds for or otherwise subsidized civilian aviation. In this country numerous small companies have been organized for commercial purposes but no large commercial ventures have been started.

New aerial routes are contemplated by the Aerial Mail Service as follows: Chicago to San Francisco; Pittsburgh to Kansas City via Cincinnati, Indianapolis, and St. Louis; New York to Atlanta, via Washington, D. C.; Minneapolis and St. Paul to St. Louis, via Chicago.

UNITED STATES NAVY, AVIATION NOTES.

Source: Reliable.

1 March, 1920.

Steam Engineering.

A representative of the Bureau of Steam Engineering had a conference with the committee on experimental power in New York on 20 February, relative to the steam boiler for aviation purposes. Developments to date are very encouraging, but there are certain problems in connection with the control of the boiler which remain to be solved.

General.

At a meeting of the Secretary's Council on 26 February, at which the organization of aviation in the department was discussed, a decision was reached on the three following points:

1. That the Aeronautical Board should be legalized.
2. That there should be some organization devised for the civil control of aviation, preferably in the Department of Commerce.
3. That there should be an aviation organization in the Navy Department.

The Department of Commerce has requested that a seaplane patrol be established on the east coast to assist in locating schools of fish. The fisherman state that they will equip a number of their boats with radio and will furnish skilled observers to locate the schools of fish. Action will be taken on their request.

DEVELOPMENT OF AIRCRAFT GUNS IN BRITISH AIR SERVICE.

Source: Reliable.

(12803.)

3 March, 1920.

Guns (heavier than machine guns) for use in aircraft have been developed to the extent of carrying out aerial firing with a 1½-pounder automatic gun mounted on the forward cockpit of De Haviland 10 (for the attack of gun targets and general aerial firing) and amidships on De Haviland 4, firing upward and forward through the center section of the top plane, for the attack of large bombers, zeppelins, etc.

Automatic sights are being developed and fairly good practice has been made at ground targets. No approved pattern for sights, however, has yet been adopted.

The gun referred to above is the Ordnance Q. F. 1½-pounder, mark 3, C. O. W., six of which are now in the possession of the American Government.

ORDNANCE.

GERMAN BORE SIGHTING ARRANGEMENTS—BORE SIGHTING AT SEA WITHOUT USE OF DISTANT OBJECT.

Source: Reliable.

(12733.)

6 September, 1919.

There were obtained from the ex-German ship *Nymphia* some very remarkable bore sighting arrangements used in the German Navy. As far as is known, all other navies bore sight by putting a bore sight in the axis of the bore and making such adjustments to the sight as may be necessary, with scale set at 0° to bring both sight and bore sight on the same distant object. In good weather the horizon does pretty well for the horizontal cross wire, but in bad weather it can not always be seen clearly, and at sea the ship may be rolling badly. At sea, there is the difficulty of there being nothing to check up the vertical wire. The need had been felt for a long time for some arrangement that would allow a ship to do its bore sighting readily at sea, and without the complications involved in the use of a distant object. This device, by means of prisms, allows the gun pointer to look into the breech of his own gun and to look down the bore with his own sight.

Various other systems to bore sight at sea without using a distant object have been attempted. One is to have bench marks on the ship as far distant as possible from the guns so that, when the gun is properly bore sighted, the bore sight is on one of these marks and the sight is on the other. Such bench marks can be put well forward on the forecastle, or well aft on the quarter deck. The usual argument against their use is that distortions of the ship ruin the accuracy of the method, and that the distance from the gun is too short for good accuracy anyway. When one carefully studies the matter and investigates the magnitude of all the quantities involved, the system looks much better than most officers consider it, and it is thought by many that it is worth while to have such bench marks and to use them.

Bore sighting in port on battens erected on the forecastle or quarter deck is, of course, the most familiar method of checking up sights and bore sights without the use of a distant object. But this can not be done rapidly, nor at sea in active service under war conditions, and can not be classified as a method for rapid bore sighting at sea in service without the use of a distant object.

Another scheme, tried by the Bureau of Ordnance and not generally known, consisted of putting on a small attachment a few inches long, screwed into a hole near the muzzle of the gun. This carried a pair of cross marks which were located in front of the sight when it was set at 0°. This method never came into general use, and only a few guns are fitted that way.

To sum up, it may be said that the usual methods for bore sighting, without the use of a distant object, involve bench marks of some sort, either on the gun or on some other part of the ship.

Method used by Germans in bore sighting at sea without use of a distant object.

There is a small attachment containing prisms in the form of two optical squares. A ray of light entering one of the openings is reflected across and comes out of the other opening, turned back parallel to its original direction and displaced to the side about 95 m. m. In this way, by putting this small fitting in front of the sight, a gun pointer can adjust it so that his head does not interfere with the line of sight which comes to the rear. In the breech of the gun there is placed a carefully manufactured self-centering plug. This plug carries a jointed periscope. The two legs of the periscope may be set at any angle to each other, and this angle is shown on a scale at the joint. The idea is to adjust the opening in the second leg of the periscope so that the line of sight, in coming back to the rear, enters the object glass. The line of sight will then be reflected up one leg of the periscope, across through the joint, down through the other leg of the periscope and out into the bore, parallel to the original axis of the sight telephone.

It will be seen that altering the angle in the jointed periscope, so as to separate the legs apart or close them in, enables the opening in the second leg of the periscope to be put at any desired distance from the center of the bore. Furthermore, the whole arrangement can be put in the breech at any desired angle. Thus the opening for the line of sight to center has sufficient adjustments to put it anywhere as it is desired to have it. There is a scale on the circumference of the breech fitting which shows how the breech fitting is put in the breech. There is one adjustment for the sight on the left of the gun and another one for the sight on the right of the gun. For instance, for use with the left sight, according to certain memoranda, the scale on the breech would be set at $216\frac{3}{4}°$, and the scale at the joint would be set about $307\frac{1}{4}°$. For use with the right side, the reading at the breech would be $143\frac{1}{4}°$, while the scale at the joint of the telescopes would read $52\frac{3}{4}°$.

These scales were not scales of precision. One's first impression is that the accuracy of the whole arrangement depends upon the establishment, with mathematical accuracy, of certain distances

which the line of sight and the parts of the periscope must be placed from the axis of the gun. Really this is not the case. If it were the case, the whole instrument would be very impracticable. It needs only a glance at the scales to see that they are rough and only for approximately locating the different parts. The apparatus depends for its success upon the parallellism with which the rays enter and come out of the optical parts, and this parallelism is not affected by the fact that the periscopes reflecting prisms, etc., may be slightly displaced from their ideal positions, so that the line of sight may be a little off center from the middle of the different openings. So long as the line of sight gets from the sight telescope into the bore of the gun, it gets there parallel to its original direction. It may enter the opening of the periscope almost at the edge of the forward opening. The small reflecting prisms in front of the telescope sight may not be perfectly at right angles across the axis of the gun, but neither of these facts would affect the parallelism of the line of sight in the bore, and in the sight telescope itself. Things would be seen slightly off the center of the field.

Lenses in the Bore.

Another box of bore sights was discovered which, it appears, can be used for distant objects in the ordinary way and may, or may not, be used in conjunction with this apparatus. There is an elaborate muzzle fitting with a lens in it and crosslines on it. There is a fitting which goes in like a cartridge case and carries other lenses at the afterend of the bore. This occupies the position where the cartridge case would go. An eyepiece extends to the rear. By this method, instead of having a small telescope a few inches long, we have virtually converted the whole gun into a telescope almost as long as those used for astronomical purposes (naturally the lenses are very flat). For ordinary bore sighting on a distant object this method of having lenses at both ends of the gun, and converting the whole gun into an enormous telescope, offers certain obvious advantages. A similar fitting for an 88-mm. gun was also found in the same box. The other fittings and the periscopes were for a gun of 150 mm. caliber.

It is believed that, in using the apparatus shown in the sketch, the muzzle fitting with the cross wires is viewed from the sight and that the image of the other crosslines in the telescope is brought to coincidence with it.

All details of the apparatus have not, at this time, been sufficiently studied to enable one to make a definite and positive statement as to exactly how the apparatus is worked. Optical experts are engaged in making a full report. This, however, will take some time. In the meantime there are certain things which we can be absolutely

sure of, and these are believed to be sufficiently interesting to make a report on at this time:

(1) For bore sighting at a distant object, the Germans used lenses at both ends of the gun.

(2) For bore sighting at sea without the use of a distant object, they used an arrangement for reflecting the line of sight of the telescope so that it looked into the breech and down the bore.

(3) The number of this periscope fitting was 168. The date on it was 1914. It was issued to a not particularly modern ship. This seems to establish the fact that the Germans have used this method extensively and for a very long time.

Markings in German Inside of Cases of Boxes Containing German Bore Sighting Gear.

In Halsverzeiches für justiergerät, at 15 cm/45 i. M. P. L. c/1914 vorsatzrohr mit 1900 (–?) reich weits Nr. 168.

1 schenkel, 10 K.
1 schenkel, 11.
1 halt vorrichtung, 8 h.
1 justierprisma mit trägen.
1 lederlappen.
1 pinsel.
1 beschreibung.
1 tabelle.
1 hierzu gehortnoch besendern aufbewahrung kasten fur 2 satz holzbacken fur 15 cm. SKL/45.
1 satz holzbacken, 6 stuck.
1 ladungramm ein matz, a.
1 okularlinse mit kreuz, a–1.
1 mündunge ein satz, b.
1 objectidlinse, b–1.
1 augenrohr, c.
1 umkenprisma, d.
2 rauchenglasse, e.
1 vorsatz linse, 12 mf.
1 vorsatz linse, 10 mf.
1 vorsatz linse, 8 mf.
1 vorsatz linse, 6 mf.
1 kienen für mundange einstaz.
1 lederlappen.
1 reinigungspinsel.
1 beschreibung.

(The foregoing was in the set of parts judged to be gear for bore sighting on a distant object, with lenses in the bore, etc. The following is for the set which checks up sights without using a distant object.)

S. M. S. Nymphia.

Tabelle für den Gebrauch des Vorsatzrohres No. 168 Fernrohr:
Linkes Geschütz: Ring-Scheibe.
Rechtes Geschütz: Ring-Scheibe.
Fernrohr.
Linke Seite: Ring, 307¼°; Scheibe, 216¾°.
Rechte Seite: Ring, 52¾°; Scheibe, 143¼°.
Stellung des Justierprismas-Basis 95 m. m.
Horizontal nach linkes.
Horizontal nach Rechtes.
"Die Stellung des Justierprismas und das beim justieren zu benut zerade augeben, stamit ein Freigehen des strahen gauges erreicht wird."

RETUBING WORN-OUT GUNS BY AUTOFRETTAGE.

Source: Reliable.

(11736A.)

16 February, 1920.

In a conversation with certain officers of the section technique this morning, some rather interesting facts concerning the question of utilizing worn-out guns in France were developed. In the first place, the process of retubing a worn-out gun with a tube whose interior diameter is the same as that of the original gun has never been contempleted.

Before the war and up until the armistice, the new tube was inserted in the gun, which had been expanded by the necessary heating process. About the time of the armistice a new system of retubing was inaugurated, using the process of autofrettage. Both the old heat-expansion method and the new autofrettage process were employed to produce a gun of lesser caliber than the original gun worn out by firing. In other words, a worn-out 24 c. m. gun, for example, is retubed to become a gun of 19 c. m. In the process of retubing by autofrettage, the new interior tube is inserted freely in the old gun, which has been bored out to the proper diameter, a hydraulic pressure is put on the interior of the tube until it expands and is gripped tightly by the surrounding jacket and hoops. The following information was obtained describing the process for a 19 c. m. tube inserted in a worn-out 24 c. m. gun. With a pressure of 3,100 to 3,300 kg. per square centimeter the expansion measured on the exterior of the old 24 c. m. gun of cast iron was from 595.95 m. m. at rest to 596.32 m. m. at full pressure. On taking off the pressure the diameter was found to be 596.02, or a resultant exterior expansion of 0.07. It has finally been decided to use a pressure of approximately 3,200 kg. per square centimeter in seating this liner.

An important piece of information was obtained during this conversation which illustrates the possible defects of autofrettage. On firing one of the 19 c. m. guns produced by retubing by autofrettage,

a worn out 24 c. m. piece, the tube was found to decrease in diameter after each successive shot, this being discovered immediately after the first few rounds. The gun was once more subjected to a high interior hydraulic pressure, and returned to its original interior diameter of 19 c. m. The gun since has given no sign of a similar condition of decreasing diameter, but only a limited number of rounds has been fired subsequent to the second autofrettage.

COMMUNICATIONS.

HISTORY OF THE UNITED STATES NAVAL COMMUNICATION SERVICE IN EUROPE SINCE THE ARMISTICE.

Source: Reliable.

9 February, 1920.

On 11 November, 1918, there was stationed at the United States naval headquarters in London a large force of expert communication officers and enlisted personnel. The necessity of keeping the force commander fully cognizant of all the activities of his command made it necessary to have all business between the various detachments and Washington pass through the London office. The average daily traffic amounted to 55,000 to 65,000 words, most of it being coded.

For most of the traffic, speed of transmission was a vital necessity. To obtain the necessary speed of handling traffic a telegraph office had been installed in the headquarters building, with leased wires to the Central Telegraph office in London, to Western Union House, London, to the London headquarters of the United States Army, to the British Admiralty and to the British Air Ministry. These lines served to give us excellent communication to all outlying commands.

The British post office, controlling all the telegraph circuits in the British Isles and the cables to the Mediterranean, were always unfailing in their courtesy to us and of course gave us special priority on all messages to the points reached by their circuits.

The wire to the Western Union House enabled us to communicate with Washington over the cables of that company with the utmost expedition. With them we always received courteous and preferential treatment and our traffic was handled with the efficiency always characteristic of that company.

The Signal Corps of the Army laid a cable across the channel from Beachy Head to Le Havre, where it connected with their wonderful wire system in France and also with the French Central Telegraph office in Paris. Through the courtesy of the Signal Corps we had a direct wire to Brest and Paris in this cable and were able to utilize their system for communication in France. The French Government gave our messages priority over their wires, thus enabling us to communicate quickly with any place in France or Italy.

By means of our wire to the Admiralty we had at our disposal

the great radio system of the British Navy and their direct wires to all naval stations. Through the Air Ministry we were always in communication with the British air stations.

Each outlying station had its own communication force, the largest being that at Brest.

At the London headquarters there was established a radio receiving station for the purpose of copying radio messages from Annapolis. This station later developed to the extent that practically all business from Washington to the force commander was handled by radio.

At Poitiers, France, there was established another receiving center for copying Annapolis, the two points being necessary to insure the reception of all messages and to have this radio circuit in proper working order to take up the burden of the cables, which was growing excessive.

At Brest United States naval operators assisted the French in the radio station at Mengam. This enabled us to have excellent radio communication with all transports at sea.

All United States naval air stations were equipped with radio sets of low power for communication with the planes in flight.

Upon the arrival of Col. E. M. House in Paris, consultations were held in regard to the best method of handling the dispatch traffic of the House Mission and the Peace Commission that would arrive later. These conferences took place between the 1st and 7th of November, and it was decided that the Navy would furnish the necessary personnel, including coding officers and yeomen, to establish the office, and that the Signal Corps of the United States Army would maintain with a staff of telegraphers the wire between Paris and the Western Union House, London.

Accordingly, Lieut. Commander E. G. Blakeslee, then force comminication officer, together with four coding officers and three yeomen, proceeded to Paris and established, about 8 November, a communication office at the headquarters of Col. House. The communications of the House commission were sent to the naval headquarters, Paris, by messenger and from there telegraphed to Washington via Western Union House, London. The naval headquarters was connected with the Army, Paris, to London wire by a pony circuit and was used probably because of its nearness to the offices of the House mission.

In the latter part of November Commander Ingersoll arrived in Paris to organize and take charge of the communication office for the Peace Commission. Early in December, when the headquarters of the Peace Commission were established in the Hotel De Crillon, a discussion arose as to whether or not the State Department should take over its own communications. Upon the recommendation of

Col. House, the matter was decided in favor of having the Navy continue this work.

From the establishment of the Peace Commission in the Crillon, all messages to Washington or to any point were handled by messenger to the Signal Corps headquarters at the Elysee Palace Hotel. In this regard the State Department, as well as the Navy Department, were under a great obligation to the Signal Corps of the Army for the assistance and cooperation received in handling dispatches. The Signal Corps built up and maintained in France a wonderful system of telegraph circuits, which were of immense assistance in handling the work.

The amount of traffic handled by the Navy for the Peace Commission was very great, most of it being in code. This necessitated a very large force of coding officers and yeomen, the number reaching nearly 30 officers and 70 enlisted personnel at times. The traffic handled amounted to approximately 40,000 words per day.

In January, 1919, Mr. Herbert Hoover, head of the American Relief Association, opened his headquarters in Paris, and arrangements were at once made for the Navy to handle his dispatch traffic. This relief association was doing an enormous amount of relief work in central Europe and in the Near East and the volume of this traffic was very great.

The communication offices in the various United States naval port offices in the German Baltic and North Sea ports and in several Adriatic ports, and the communication officers with the various Peace Commission Field Missions, were used by the American Relief Association to handle its business. At Constantinople the American naval forces handled practically all of the relief business as well as the business of some American commercial companies, who would otherwise been unable to get their traffic through.

Early in the year 1919, the Navy also undertook to handle the business of the Shipping Board in London and Paris, the Petroleum Mission and Ship Control Committee in London, the Committee on Public Information in London and Paris, and the Belgian-Poland Relief Committee in London.

During both of the trips of President Wilson to Europe arrangements were made for continuous communication with him while at sea. These arrangements were successful, due to the courteous offer of the French Government, for the use of their high-power radio station at Lyons. Messages from the President were received at the United States naval receiving station at Poitiers and also at the British Admiralty station on the Azores Islands.

In January, 1919, at the request of the State Department, communication officers were furnished for the field missions going to Berlin, Vienna, and southern Russia.

The Berlin party consisted of five officers and four enlisted men. The party left Paris the 27th of January and arrived in Berlin about the 2d of February. Arrangements were at once made to communicate with Paris via German wires to the United States Army headquarters at Coblentz and from thence to Paris over Signal Corps wires. A small amount of work was done by this field party for the American Relief Association. Communications for the United States naval port offices at Hamburg and Dantzig were handled by this office. The mission completed its work and returned the last of February.

The Austrian field party had its headquarters in Vienna. The communication section for this field party consisted of six officers and five enlisted men. They arrived in Vienna and took up their duties February 6. They were fully equipped with radio receiving apparatus in case the wire communication was unsatisfactory. Wire communication with Paris was, however, established through Berne, Switzerland. Observation parties were stationed at Prague, Budapest, Agram, Trieste, and Fiume. Considerable difficulty was at first experienced in keeping these wires in order. However, with the arrival of the relief association, it became a matter of policy for the Governments concerned to keep the wires clear.

It was unnecessary to use radio as a means of communication, but the receiving apparatus was used for picking up press time and hence keeping the commission generally informed of the progress of events outside of Vienna. These news items were generally received in this way, three or four days ahead of the same items on the telegraphs. Officers or men were detailed to assist at Warsaw, Prague, and Budapest. On 24 March most of the party left Vienna, returning to Paris. A small communication section remained in Vienna for a few weeks longer.

The Russian field party, with four communication officers and seven enlisted men, left Paris 11 February. Complete sets of radio receiving gear were taken along. Upon arrival at Constantinople the party divided into three sections, going to Tiflis, Ekaterinodar, and Odessa. Arrangements were made for intercommunication by using suitable Russian radio stations and land wires. Communication with Paris was established through the naval forces at Constantinople. At Odessa, the headquarters of the main party, a radio receiving station was installed and radio press copied from American and European stations. This press was delivered to the American consul and such parts of it as were of interest to the Americans in that section were published in the local press. In April, when the city of Odessa was evacuated, the communication party was of great assistance to American and British citizens. One officer remained at Ekaterinoda until October and one at Tiflis until November, 1919.

During April the dispatch traffic became so heavy that the Navy was unable to handle all of the business for the American Relief Association and the Shipping Board. In addition it was felt that the Navy should not be called upon to bear the entire expense of this traffic. For this reason the two activities established communication offices of their own, using in many instances demobilized Army and Navy personnel.

Certain American Relief Association work was, however, carried on by the Navy. The American Relief Association had taken over the control of certain telegraph lines in central Europe. These lines were in charge of an Army officer. They were not operating very successfully due to the difference in nationalities of the operators at each end and to the antiquated system in use. Early in April nine Navy telegraphers were sent to Vienna. The wires from Vienna to Trieste, Prague, Warsaw, and Budapest, Zagreb to Belgrade, were opened. A radio schedule from Bucharest to Vienna was arranged, but the Roumanians failed to carry out their agreements, hence this line of communication never amounted to much. From Vienna a line to Coblentz, the United States Army headquarters, was taken over. Messages were passed on to Paris over the Signal Corps wires between Coblentz and Paris. This wire between Vienna and Coblentz gave considerable trouble, hence an alternative wire, Vienna to Leipsic to Hamburg to Bremen to Coblentz, was secured. The Hamburg wire later proved very useful as the American Relief Association established an office at that point and put American operators in the office.

In June, having received orders to send all reserves out of Europe by 1 July, the American Relief Association secured ex-Army operators to continue the work. Two naval operators remained in Vienna, however, to handle the work from our Adriatic forces to London. One of these men was instrumental in reestablishing the Vienna-Budapest circuit, which was cut during the régimé of Bela Kun in Vienna.

Meanwhile efforts were being made to better traffic to Constantinople, which by cable was very slow, and also to get an additional line of communication to the Adriatic, the existing line being subject to frequent interruptions. Arrangements were made with the British Marconi Co. for two schedules on their Carnarvon station. On these two schedules all traffic was sent to Constantinople and the Adriatic. This schedule has been extremely satisfactory, as the messages get through with a maximum delay of 12 hours and very free from garbles. A schedule from the flagship in the Adriatic and London was arranged in the summer, but due to the unsatisfactory receiving apparatus in London the schedule was not particularly satisfactory.

On 5 July the Army gave up their circuits between London and Paris, London and Brest, and Paris and Brest. It was felt at the time that naval and Peace Commission traffic warranted holding leased wires between these points, hence the Navy took over the lease of the wires from London to Paris and from Paris to Brest. This necessitated the placing of naval operators in Western Union House, London, and at Le Havre, France, where a repeater station was located. Further in the interests of economy, since the Army dismantled their telegraph station at the Elysee Palace Hotel, in Paris, all the offices in that city were centralized at the Hotel Crillon. The Crillon had wires to Coblentz, Brest, London, and a circuit to naval headquarters, French Central Telegraph office, and the French central radio bureau. The office at the latter place has been of great value to us in that our traffic for Washington was sent over leased wire from London to the central radio bureau and through the courtesy of the French officials to Lyons, thence to Washington via radio. This was a free service, the result being that practically all naval dispatch traffic is handled by radio at no cost. In the case of messages of great urgency, this route proved much faster than the cables.

The staffing of these wires threw upon the shoulders of the Navy personnel the vast amount of abstracting work necessary properly to allot the charges to other branches of the Government.

In August the American Relief Association finished its work in central Europe and proposed to give up its lines. The surrender of these lines would have hampered greatly the work of the Peace Commission, and hence at their request the Navy undertook to staff them. This system consisted of the following lines:

Paris to Coblentz to Vienna.

Vienna to Mahrisch Ostrau to Warsaw.

Vienna to Prague.

Vienna to Budapest.

Vienna to Lubiana to Zagreb to Belgrade.

Lubiana to Trieste to Pola to Spalato (Navy wires). Between Paris and Coblentz linemen with motor cycles were stationed at Chaumont and Thionville.

Promptly upon taking over the lines steps were taken to arrange for duplex working between Paris and Vienna. Thanks to the skill and energy of the personnel this was shortly done. Further, considerable trouble developed on the line from Lubiana to Belgrade. After a period of negotiations between the chief electrician in charge of the lines and the Jugo-Slav minister of posts and telegraphs, arrangements were made to take over a wire from Budapest to Belgrade. However, trouble was experienced when it came to getting this line across the frontier between the Roumanians, who were then in Hungary, and the Jugo-Slavs. The difficulties were, however, elimi-

nated as a result of conferences between the chief electrician in charge and the Roumanian chief of staff. The completion of this circuit, Budapest to Belgrade, enabled us to eliminate the two operators at Lubiana and Zagreb and gave better service between Vienna and Belgrade and between Vienna and Trieste.

Following the usual practice of paralleling wire circuits with radio wherever possible, arrangements were concluded with the Austrians, giving us certain schedules on their radio station at Deutsche Altenberg, just outside of Vienna, to work with the Adriatic and London. This radio station was connected by wire with the United States naval communication office in Vienna. It has been a most satisfactory means of getting our work through during the periods of wire trouble.

All the offices were put in excellent working order and the equipment, especially at Vienna and Coblenz, was made up to date in all respects. The personnel of these parties deserve the greatest credit for the way they performed their duty under trying circumstances. An incident worthy of note occurred at Budapest during the Roumanian occupation. Three Roumanians and a Hungarian lineman walked into the American Telegraph office. The Roumanians gave some directions in Hungarian to the lineman, which were not understood by our operator, but as his wire was in trouble he thought they were making a test. However, they disconnected all instruments and started to take them away. The American then asked them what they proposed to do. They informed him that they had orders to remove the material. Since it was the property of the Navy, the American put his gun on the table and ordered them to drop the material and stand in the corner. This they did, while he telephoned to the American Mission to get a soldier. When the soldier came, they were left in his charge while the naval operator went out to find out about their orders. He was unable to locate the origin of the orders and hence after detaining them about two hours, he let them go.

With the coming of the fall and winter months, and the consequent better radio conditions and with the installations of a new amplifier at the London receiving station, a schedule direct with the flagship of the eastern Mediterranean forces was arranged and has been working most satisfactorily for some months. All traffic from these forces is now handled on these schedules. All traffic to these forces goes by radio from Carnarvon.

The traffic from Constantinople has always been subject to delays and garbles. With the arrangements to use the Vienna station satisfactorily made, this traffic was somewhat bettered by using radio from Constantinople to Spalato to Vienna to London. To further better this traffic a radio receiving station, similar to that in London, is being installed at Vienna. Schedules are being arranged between

Constantinople and Vienna with every prospect of success. A night schedule from Constantinople to London is being tested and while not very satisfactory is of some value.

With the return home of the Peace Commission, the State Department undertook to do its own coding work in Paris. This released practically all of the coding officers. This department has further taken over the lease of the Paris-London wire and has replaced with civilians the naval operators at Western Union House, London, and Le Havre. The Paris and London (Embassy) ends are still staffed by naval personnel, as are the lines in central Europe. The State Department pays the subsistence allowance of the men in central Europe now, with the assistance of the European Child Relief Association. The whole system is however operated by the Navy.

Work is being handled for all legations in central Europe, Child Fund, various American, British, French, and Italian commissions, newspapers, the United States Army and certain authorized individuals, the American Committee for the Relief of the Near East, Red Cross, Knights of Columbus, some industrial companies, besides our legitimate Navy work.

The numberless codes used have all passed through the London office as a distributing point for all European forces and naval attachés. The work of the code and signal section in delivering and keeping the records of all the publications has been considerable.

The number of operators has gradually been reduced until we now have 1 each at Prague, Belgrade, and Budapest, 3 at Trieste, 3 at Spalato, 1 officer and 9 operators at Vienna, and 1 officer and 9 operators in Paris, in addition to a total commissioned and enlisted personnel of 40 in London.

SUBMARINES.

EX-GERMAN SUBMARINE U-135.

Source: Reliable.

(12630–A.)

DIVING TRIALS 5TH JANUARY, 1920.

These were on the first day of the official trials, and included:

Measured mile runs submerged at 5½ and 7 knots; turning submerged.

Handiness submerged, depth keeping, hydroplanes in "power" and hand.

Trial of pumps at a depth.

Main motor-cooling system records.

Analysis of air and temperature of compartments.

Battery capacity trial.

Left harbor 9.15 a. m. and dived in Whitsand Bay from 10.40 a. m. to 4.20 p. m., about 5½ hours' continuous diving.

MEASURED MILE RESULTS.

Polperro mile, 6,990 feet; sea calm, wind 2.

At periscope depth (12–13 meters on depth gauge).

(A) Main motors at full, fields in parallel, 800 amperes on each (3,200 amperes total).

G. M. T. (a. m.)	Course.	Time.		Speed (knots).	Revs/Min.		Remarks.
		M.	S.		P.	S.	
	°						
I. 10.45...	266	10	21⅗	6.66	.....	.....	Volts, 245.
II. 11.15...	86	15	42	4.39	194	197	Amperes, 3,200 total.
III. 11.47...	266	10	27	6.60	200	198	Electrical horsepower, 1,050.
Mean..	.....	.....	.....	5.56	198	197½	1,050 electrical horsepower.
					198 revs.		

(B) Main motors in parallel at normal full speed, 1,450 amperes on each (5,800 amperes total).

G. M. T. (p. m.)	Course.	Time. M.	Time. S.	Speed (knots).	Revs/Min. P.	Revs/Min. S.	Remarks.
	°						
I. 12.15....	86	11	22	6.07	250	252	Volts, 210.
II. 12.35....	266	8	35½	8.06	245	248	Amperes, 5,800 total.
					247½	250	1,635 electrical horsepower.
					249 revs.		

Control of boat on measured mile.

Depth keeping was erratic during the first run, with large angles on the planes and depth varying from 10 to 16 meters. Toward the end of this run the after planes jambed and the main motors were stopped for about 15 seconds.

The revolution records were consistent, lying on a straight line passing through the origin and corresponding to about 35½ revolutions per knot.

The electrical horsepower results, however, are discordant, the present trials giving 1,050 at 5.56 k., the Blyth trial 887 by watt meter, 782 by amperes x volts, at 5.8 k.

The latter is probably the correct one, as it agrees fairly well with the present result for the higher speed, assuming horsepower varies as cube of speed.

It would be interesting to repeat these trials, the ship being supplied for the trials with ammeters more sensitive than those permanently fitted on the switchboards which indicates only to the nearest 100 amperes.

TURNING SUBMERGED.

The starting times were taken when ship had swung a few degrees off her original course, helm not being used to steady ship on new course until a farther 180° had been completed.

(A1) Main motors as for measured mile A, i. e., full fields in parallel, giving 198 revolutions on each shaft (5½ k.), helm hard-a-starboard (30°):

Time to turn first 90°, 1 minute 49 seconds.

Time to turn second 90°, 1 minute 30 seconds.

For the half circle, 3 minutes 19 seconds or 1.1 seconds per degree.

(A2) Outer screw speeded up to normal full speed (252 revolutions) on putting helm over, inner screw at full fields 195 revolutions, helm hard-a-starboard:

Time to turn first 90°, 1 minute 32 seconds.

Time to turn second 110°, 1 minute 53 seconds (for 110°).

For 200°, 3 minutes 25 seconds (for 200°), or 1.02 seconds per degree.

(B) Main motors as for measured mile B. i. e., in parallel, giving 250 revolutions on each shaft (7 k. initial speed), held hard-a-starboard:

Time to turn 180°, 2 minutes 56 seconds, or 0.97 second per degree.

The boat had a slight tendency to come up during these turns but was easily controlled.

Diameter of Turning Circle.

Assuming average speed during turn to be 90 per cent of the initial and that ship's path is a circle, the diameters from the above data are:

(A1) At 5½ k. initially, 198 revolutions on both, 356 yards.

(B) At 7 k. initially, 250 revolutions on both, 400 yards = 4.3 ship's lengths.

Comparison with Previous Result.

On 12 August, off Blyth, at 5.8 k. initial speed:

Time to turn 8 points (from order "hard-a-starboard"), 1 minute 55 seconds.

Steadied after 16 points (from order "hard-a-starboard"), 4 minutes.

The conditions, therefore, are not quite the same, but allowing for the difference there is general agreement.

Hydroplanes in Hand Gear (2 p. m. to 2.30 p. m.).

"Power" to "hand" was quickly and easily effected by means of the air-operated clutches.

"Hand" to "power" can only be effected by hand and requires an additional man to pull over the clutch lever, the coxswain "shaking" the wheel to allow dog clutch to engage.

Working in "hand."—This was tried on the forward and after planes separately and the boat was kept under control at 5½ k. without difficulty. One man was able to work the wheel with little effect, the ratio of gearing being much lighter than the usual British practice. The forward planes require 110 turns and the after planes 90 turns hard over to hard over when in hand gear.

The forward planes were also worked from the wheel in the fore compartment, the control still being effected from the control room by means of the electric order instruments of "follow-the-pointer" type. This appeared to be quite a satisfactory method of control, and the gear is of course more easily worked from the local position forward as the control shafting abaft it is disconnected. On reconnecting to the control room position it is necessary to bring the indi-

cators into step either by clutching up everything at (say) zero or by resetting the control room indicator (the easier method).

Handiness submerged.

While changing after planes back to "power" the boat became unmanageable. This was accentuated by the port main motors becoming defective at just this period and having to be stopped for the remaining part of the dive. The boat went to 22 meters at an angle down by the bow. Nos. 6 and 7 M. B. tanks were blown and the boat came to 9 meters (bridge out about 1 meter), bow up. The after planes were tried in "power" and found to be working correctly, and it was decided to dive again. Boat was again found to be unmanageable and appeared very heavy forward; the bubble went off the board (estimated at 15°) and depth gauge showed 22 meters before she could be stopped by blowing first Nos. 6 and 7 M. B. tanks and then the forward group (8, 9, and 10 M. B.).

Auxiliary tanks which might affect the trim were then sounded. No alteration had taken place in the trimming tanks, but the water in the regulating tanks had possibly increased somewhat. This, however, would not account for the boat becoming bow heavy and the most likely explanation is that on the reduction of speed due to stopping the port main motors the trim was not sufficiently good, although the boat had been well under control at the higher speeds.

Experience with the boat has shown that to maintain an even depth line the hydroplane must be used more freely than in the average British submarine, i. e., an alteration of 10° or 15° of helm is required in *U–135* when in the average British boat 5° would suffice. It is necessary that the men on the planes should become familiar with this difference, but even allowing for this, the handiness submerged is not good, although apparently much better than in some of the other German boats.

Comparison of hydroplane areas with those of British S/ms.

	M.	L. 50.	J.	U–135.	Remarks.
Forward planes (square feet)	82	70. 4	59	75	Both sides in all cases.
After planes (square feet)	130	71. 3	90	75	
Submerged displacement (tons)	2, 040	1, 160	1, 910	2. 000	
Length over all (feet)	300	235	275½	275½	

Trial of Pumps.

The boat was taken to the bottom in 28 meters (92 feet) and the port forward regulating tank flooded.

Time to pump out with two-stage centrifugal pump on high capacity setting, i. e., impellers in parallel, 3 minutes 39 seconds.

Capacity of tank, 9,400 liters.

This is at rate of 154½ cbm/hour or 156 ton/hour.

Amperes, 230; volts, 225; electrical horsepower, 69.5.

Trial on surface at Blyth gave 408 tons/hour with 75 electrical horsepower.

The present trial was at 28 meters, only 2 meters less than the nominal maximum for the high capacity setting (0–30 meters).

The midship auxiliary bilge pump was also used to pump out control room bilge at this depth.

Main Motor Cooling System.

The efficiency of this system can be judged by the temperature of the motor room itself, as the fans ventilating the motors draw their air from the motor room, discharge it through the motors then via coolers back to the motor room.

Motor Room Temperature.

Time.	Temperature.	Remarks.
	°F.	
10. 45	60	Neither fans nor cooling water running.
11. 5	61½	
11. 23	63	
11. 45	65	
11. 55	68	One fan each side started on both motors.
12. 15	73	
12. 20	78	
12. 30	80	
12. 35	82	
12. 40	84	Started second fan on each side.
12. 42	88	
12. 50	90	Started water cooling on each side.
1	80	
1. 7	78	
1. 25	76	
1. 40	78	
1. 50	78	2 water cooling stopped. 2.10 water cooling restarted.
2. 15	75	
2. 30	74	
2. 45	74	
4	71	4–5 came to surface.
6. 15	70	

Temperature of sea, 48°.

These results, extending over a 5½-hour dive, show clearly the effect with and without coolers.

In the first two hours the motor room rose from 60° to 90°. During this period the motors were running at full fields for 1½ hours and at normal full speed for the last one-half hour. One fan each side was started halfway through this 2-hour period without arresting the rise in temperature.

The second fan each side and the coolers were then brought into use (12.50 p. m.). There was an immediate and rapid fall in tem-

perature, 10° in 10 minutes, followed by a steady fall maintained to the end of the dive.

Net rise of temperature during the dive was 10°, which would have been considerably less, possibly nil, if the coolers had been run from the commencement.

The cooling system also has an indirect but marked effect on the main motor bearing temperature, vide the following results:

Temperature of Main Motor Bearings.

Time.	Port.		Starboard.		Remarks.
	For-ward.	Aft.	For-ward.	Aft.	
10. 30	67	67	67	67	Motor casing temperature, 88°.
11. 30	91	92	92	92	
Noon.	106	95	107	95	
12. 30	119	104	120	106	Motors at full speed for one-half hour.
12. 55	122	108	122	110	12.50 casing temperature 110° started cooling system.
1. 10	125	108	125	106	1.10 casing temperature, 100°.
2. 15.	125	108	125	110	2.15 casing temperature, 90°.
3. 20	105	95	112	95	
4. 10	91	89	91	89	

The temperature noted at 1.10 and 2.15 on the Ford motors may have been exceeded, 125° being the maximum reading on the thermometer scale.

The starting of the cooling installation at 12.50 (after the full-speed runs) brought the main motor-bearing temperatures down by the end of the dive to a lower figure than the previous maximum at full fields, viz, at noon.

Analysis of Air Samples and Temperatures of Compartments.

A copy of the results of the air analysis has been forwarded separately. In addition to the temperature given with those results, the following were observed:

	°
Fore compartment 10.40	56
Fore compartments 11.48 to 2.40	51
After compartment 10.40	51
After compartment 11.48	49
After compartments 12.50 to 2.45	55
Ward room 12.20	58
Ward room 12.50	60
Ward room 2.10	64
Control room 1	63
Control room 2.40	59
Main engine room 1	67
After crew space 2.40	67

Wet and dry bulk thermometers were not available.

FOUR HOURS' TRIAL AT SLOW SPEED.

Measured Mile Results.

Polperro mile, 6,990 feet.
Wind, force 4–5, ahead when going west.
Sea, 3–4, slight.
Draft of water, 14 feet forward and aft (approximately M. B. trim).
Displacement, 1,160 tons.
Last docked July, 1919; bottom now fairly clean.

No. of run.	G.M.T.	Course.	Time.		Speed (knots).	R. P. M.	
			Minutes.	Seconds.		Port.	Starboard.
I	Noon.	266	12	$46\frac{1}{5}$	5.40	151	146
II	12.37	86	10	$57\frac{1}{5}$	6.30	153	153
III	1.10	266	12	$52\frac{2}{5}$	5.36	148	150
IV	1.46	86	11	$5\frac{3}{5}$	5.87	148	152
Mean					5.78	150	[1] 150

[1] Per minutes (635 I. N. P.).

Speed for the four hours deduced from the above data, 5.78 knots.
Distance run per ton of fuel, 66.1 nautical miles.
Consumption of fuel in pounds per indicated horsepower per hour, 308.
Propellers: Two in number; bronze three-bladed, outward-turning. Pitch, ———; diameter, ———; expanded blade area (per propeller), ———.
Immersion of upper edge, 4 feet, 6 inches.

Four hours' trial.

[Pressures in kilograms per square centimeter; temperature in centigrade.]

	First hour.	Second hour.	Third hour.	Fourth hour.	Mean.
Engine revolutions per minute:					
Port	151.3	150	152	152	151.32
Starboard	146.5	154.5	151.8	148.3	150.27
Average	148.9	152.2	151.9	150.0	150.59
Slip of clutch	0	0	0	0	0
Compressor:					
First stage—					
Port	4.4	4.3	4.3	4.3	4.325
Starboard	4.4	4.2	4.2	4.2	4.25
Second stage—					
Port	19	19	19	19	19
Starboard	20	19	20	19.5	19.60
Third stage—					
Port	64	64	65	65	46.50
Starboard	73	72	74	71	73.50
Blast pressure:					
Port	62	62	62	62	62
Starboard	73	72	72	70	71.75
Pressure of circulating water:					
Port	1.7	1.7	1.7	1.7	1.7
Starboard	1.7	1.7	1.7	1.7	1.7
Maximum temperature of circulating water outlet from engine:					
Port	15	15	15	15	15
Starboard	16	16	16	16	16

Four hours' trial—Continued.

	First hour.	Second hour.	Third hour.	Fourth hour.	Mean.
Temperature of circulating water out from exhaust pipe:					
Port	15	15	15	15	15
Starboard	(1)	(1)	(1)	(1)	(1)
Temperature of sea water	8.3	8.3	8.3	8.3	8.3
Circulating pump:					
Voltage, port	265	265	265	265	265
Amperes, port	35	28	25	26	28.50
Forced lubrication oil, port	4	4	4	4	4
Pressure before filter, starboard	4.5	4.5	4.5	4.5	4.5
Pressure after filter:					
Port	4	4	4	4	4
Starboard	4.5	4.5	4.5	4.5	4.5
Piston cooling pressure:					
Port	4	4	4	4	4
Starboard	4.5	4.5	4.5	4.5	4.5
Piston cooling oil, temperature before entering cooler:					
Port	20	18	19	19	19
Starboard	20	18	19	[2] 19	[2] 19
Piston cooling oil, temperature before entering pistons:					
Port	16	16	16	16	16
Starboard	16	16	16	[3] 16	[3] 16
Bearing oil pressure:					
Port	1.5	1.6	1.6	1.6	1.575
Starboard	1.5	1.5	1.5	1.5	1.50
Temperature of oil entering bearings:					
Port	16	16	16	16	16
Starboard	16	16	16	16	16
Temperature of oil leaving bearings, port and starboard [4]	.....	.....	.....	.....	.....
Amount of lubricating oil expended [5]	.....	.....	.....	.....	.....
Forced lubrication pumps:					
Volts, starboard	265	265	265	265	265
Amperes	47 (?)	56	56	57	56.50
Fuel expended (4 hours)	[6] 400	[6] 400	[6] 400	[6] 400	[6] 400
Quality of fuel (American distillate)	.....	.....	.....	.....	.....
Specific gravity of fuel	.89	.89	.89	.89	.89
Average mean indicated pressure (pounds per square inch):					
Port	38.5	.....	.....	39.8	39.15
Starboard	38.3	.....	.....	39.4	38.83
Indicated horsepower:					
Port	315	.....	.....	324	319.50
Starboard	312	.....	.....	320	316.50
Total, port and starboard	627	.....	.....	644	635.50
Maximum explosion, pressure (pounds per square inch)	[7] 571	.....	.....	[8] 648	.....
Mean explosion pressure (pounds per square inch)	524	.....	.....	528	526
Fuel consumption, pounds per indicated horsepower	.308	.308	.308	.308	.308
Fuel consumption (pounds per B. H. P.), assuming efficiency of 0.6 at this power	.51	.51	.51	.51	.51

[1] Not taken.
[2] After leaving piston.
[3] Before entering piston.
[4] Can not be taken.
[5] Negligible.
[6] Liters.
[7] No. 5 port.
[8] No. 3 starboard.

Measured mile results at 200 R. P. M.

Wind: Force 3–6, ahead going west.
Sea: 1–2.
Other conditions: As for measured mile at slow speed.

No. of run.	G. M. T.	Course.	Time.		Speed (knots).	R. P. M.	
			Minutes.	Seconds.		Port.	Starboard.
	A. M.						
I	11. 32	66	7	48	8. 85	207	200
II	11. 57	266	7	$57\frac{1}{5}$	8. 79	203	193
	P. M.						
III	12. 23	86	7	$58\frac{1}{5}$	8. 66	201	201
IV	12. 48	266	7	$46\frac{4}{5}$	8. 86	202	202
V	1. 17	86	8	$3\frac{2}{5}$	8. 56	200	208
Means:							
First four					8. 76	202	200
Last four					8. 73		
						201	

Indicated horsepower, port and starboard, 1,205.50.
Speed for 4 hours deduced from above data, 8.76 knots.
Distance run per ton of fuel, 68.5 nautical miles.
Consumption of fuel in pounds per indicated horsepower per hour, 0.238.
Propellers: As already stated (see slow speed measured mile results).

Four hours' trial.

[Pressure in Kg/cm.; temperatures C°.]

	First hour.	Second hour.	Third hour.	Fourth hour.	Mean.
Engine revolution:					
Port	193	202	198. 5	201	198. 60
Starboard	203	206	205	203. 3	204. 30
Average					201. 45
Slip of clutch (if any)	0	0	0	0	0
Compressor, first stage:					
Port	3. 8	4. 0	3. 8	3. 9	3. 87
Starboard	4. 2	4. 2	4. 1	4. 2	4. 17
Second stage:					
Port	20	18	19	18	18. 75
Starboard	20	20	19	19	19. 50
Third stage:					
Port	76	78	77	76	76. 75
Starboard	75	80	76	79	77. 50
Blast pressure:					
Port	66	74	70	72	70. 50
Starboard	73	77	74	76	75. 00
Pressure of circulating water:					
Port	1. 6	1. 6	1. 6	1. 6	1. 60
Starboard	1. 5	1. 5	1. 5	1. 5	1. 50
Maximum temperature of circulating water, outlet from engine:					
Port	17	17	17	16	16. 75
Starboard	20	19	19	19	19. 25

Four hours' trial—Continued.

	First hour.	Second hour.	Third hour.	Fourth hour.	Mean.
Temperature of circulating water, outlet from exhaust:					
Port	18	18	18	17	17.75
Starboard	(1)	(1)	(1)	(1)	(1)
Temperature of sea water	48	48	48	48	48.00
Circulating pump, voltage	250	250	250	250	250.00
Amperes:					
Port	15	14	15	14	14.50
Starboard	35	25	35	34	34.75
Forced lubrication oil, pressure before filter:					
Port	4	4	4	4	4.00
Starboard	4.25	4.3	4.25	4.2	6.25
Pressure after filter:					
Port	4	4	4	4	4.00
Starboard	4.25	4.3	4.25	4.2	4.25
Piston cooling pressure:					
Port	4	4	4	4	4.00
Starboard	4.5	4.25	4.2	4.2	4.29
Temperature before cooling:					
Port	24	24	24	23	23.75
Starboard	24	24	24	24	24.00
Temperature before entering pistons:					
Port	18	18	18	18	18.75
Starboard	17	17	17	17	17.00
Bearing oil pressure:					
Port	1.5	1.5	1.5	1.5	1.50
Starboard	1.5	1.5	1.5	1.5	1.50
Temperature of oil entering bearings:					
Port	18	18	19	18	18.25
Starboard	17	17	17	17	17.00
Lubricating oil expended (gallons)	35	35	35	35	35.00
Forced lubrication pumps:					
Volts, starboard	250	250	250	250	250.00
Amperes	52	53	53	53	52.75
Fuel expended, 4 hours (liters)	585	585	585	585	585.00
Quality of fuel [2]	.....	.....	.....	.....	.....
Specific gravity of fuel	.89	.89	.89	.89	.89
Average means indicated pressure, pounds per square inch:					
Port	52.9	57.7	.....	.....	55.30
Starboard	54.3	56.8	.....	.....	55.55
Average indicated horsepower:					
Port	568	630	.....	.....	599.00
Starboard	594	619	.....	.....	606.50
Average indicated horsepower, total starboard and port	1,162	1,249	.....	.....	1,205.50
Maximum explosion pressure, pounds per square inch, No. 5 port	650	625	.....	.....	637.50
Mean explosion pressure, pounds per square inch	568	555	.....	.....	561.50
Fuel consumption, pounds indicated horsepower per hour	232	232	232	232	232.00
Fuel consumption, pounds brake horsepower per hour (assuming brake efficiency of 0.6 at this power)	.4	.4	.4	.4	.4

[1] Not taken.

[2] American distillate.

Main Engine Trials at Three-Quarter Power.

13 January, 1920.

Left harbor 9.10 a. m.; commenced trial 9.30.

Measured Mile Results.

Polperro mile, 6,990 feet.

Wind, force 3, southwest (on port bow going west).

Sea, 2, slight swell (in practically same direction as the wind).

Draft, 14 feet mean, approximate main ballast trim.

G. M. T. (a. m.)	Course.	Time.		Speed (knots).	Revolutions.	
		Minutes.	Seconds.		Port.	Starboard
I. 10.33	266°	6	$\frac{1}{5}$	11.49	.....	.....
II. 10.50	86°	5	$6\frac{4}{5}$	13.49	.....	.....
III. 11.8	266°	5	$51\frac{3}{5}$	11.76	.....	.....
IV. 11.27	86°	5	$7\frac{3}{5}$	13.46	.....	.....
Mean	.....	.....	.....	12.59	300	301.6
					300.8	

Results for the 4 hours: 12.59 knots; port, 300.5; starboard, 301.2; mean, 300.8 revolutions per minute; 3,045 indicated horsepower. Fuel consumed, 1,530 liters in the 4 hours, from which the following is deduced:

Brake horsepower (assumed 0.675 of indicated horsepower, based on German records of shop tests on a 550-horsepower engine), 2,033.

Distance run per ton of fuel, 37.65 nautical miles.

Fuel consumption, pounds per horsepower per hour, 369 (brake), 246 (indicated).

Endurance (allowing 400 liters per day for auxiliary purposes, an estimate for cruising on surface).

(*a*) With main oil tanks only, 65 tons, at 0.89 S. G., 7.8 days or 2,347 nautical miles.

(*b*) With reserve oil tanks in addition, 208 tons, at 0.89 S. G., 24.9 days or 7,525 nautical miles.

Turning Trials.

The times for the half turns between each pair of mile runs were taken as for previous trials, starting times being taken after ship had swung a few degrees off original course, and helm not being used to steady ship on new course till a further 180° had been completed.

Results.

Both engines at 300 revolutions, full helm 30°.

Wind, sea, and draft of ship, as for measured miles.

Helm: First turn, hard-a-starboard, away from wind. Second turn, hard-a-starboard, into wind and sea. Third turn, hard-a-starboard, away from wind.

	Time interval.	Rate of turning, seconds per degree.	Time interval.	Rate of turning, seconds per degree.	Time interval.
Through first 90°	48 seconds	0. 53	48 seconds	0. 53	50 seconds.
Through second 90°	54 seconds	. 59	51½ seconds	. 57	54 seconds.
For the half turn	1 minute 42 seconds.	. 56	1 minute 39½ seconds.	. 55	1 minute 44 seconds.

Times for a complete circle were then taken, two sets of times with a difference of phase of 20° in direction of ship's head and 19 seconds in time, as on previous trials.

Full starboard helm, 30°; both engines at 300 revolutions.

NOTE.—Seven seconds taken to put helm on; 19 seconds for ship to swing 20°.

These results are also shown in the following table:

Full helm.

	Starting time from order "Hard-a-starboard" (30°); time to put helm over, 7 seconds.		Starting time from moment ship's head had swung 20° (starts 19 seconds after order "Hard-a-starboard").	
	Time interval.	Rate of turning, seconds per degree.	Time interval.	Rate of turning, seconds per degree.
First 90°	59 seconds	.....	52 seconds	.....
Second 90°	54 seconds	.....	51 seconds	.....
Third 90°	52 seconds	.....	54 seconds	.....
Fourth 90°	55 seconds	.....	56 seconds	.....
First half circle	1 minute 53 seconds.	0. 63	1 minute 43 seconds.	0. 57
Second half circle	1 minute 47 seconds.	. 60	1 minute 50 seconds.	. 61
Complete circle	3 minutes 40 seconds.	. 62	3 minutes 33 seconds.	. 59
Diameter (assuming 10 per cent average reduction in speed).	445 yards	.....	430 yards	(1)

[1] See note later re sextant angle results.

A complete turn with 15° helm was also made, wind and sea on port bow at commencement of turn.

15° helm.

	Starting from order starboard 15 (time to put helm on, 7 seconds).		Starting from moment ship's head had swung 20° from original course (starts 24 seconds after helm order).	
	Time interval.	Seconds per degree.	Time interval.	Seconds per degree.
Through first 90°	1 minute 24 seconds.	.....	1 minute 18 seconds.	.....
Through second 90°	1 minute 25 seconds.	.....	1 minute 27 seconds.	.....
Through third 90°	1 minute 29 seconds.	.....	1 minute 28 seconds.	.....
Through fourth 90°	1 minute 19 seconds.	.....	1 minute 14 seconds.	.....
First half circle	2 minutes 49 seconds.	0. 94	2 minutes 45 seconds.	0. 92
Second half circle	2 minutes 48 seconds.	. 93	2 minutes 42 seconds.	. 90
Complete circle	5 minutes 37 seconds.	. 93	5 minutes 30 seconds.	. 91
Diameter (assuming 10 per cent average reduction in speed).	682 yards	.....	670 yards	.....

The turning diameter was also observed by taking sextant angles before and after a turn of 180° on a hill 427 feet high for (*a*) and 194 feet for (*b*).

Results.—(*a*) For full helm, 320 yards and 290 yards (the former was the better observation); (*b*) for 15° helm, 617 yards.

General remarks (for Tuesday, January 13).

Vibration of engines.—The engines were remarkably firm and rigid. It was quite possible to write in a note book resting on them.

Smoke from engine exhaust.—Nil. A white cloud of steam was caused every time the exhaust pipe outlets were washed over by the sea.

Engine hatch was kept open all day while at sea.

Rolling and pitching.—Practically nil. No opportunity for timing the period.

Temperature of engine circulating water after leaving gravity tank.—90° F. at end of the trial. Sea temperature, 48° F.

Air compressor trials: Starboard charging engine, revolutions, 400; amperes, 1,000. Group No. 3, two bottles; cubic capacity, 35.3; air starting bottle shut off.

Time.	Pressure.	Time.	Pressure.	Time.	Pressure.
9. 0	60	9. 34	110	10. 8	140
9. 2	68	9. 36	112	10. 10	141
9. 4	71	9. 38	113	10. 12	142
9. 6	[1] 74	9. 40	115	10. 14	144
9. 8	[2] 79	9. 42	117	10. 16	145
9. 1	82	9. 44	120	10. 18	147
9. 1	84	9. 46	121	10. 20	148
9. 1	86	9. 48	122	10. 22	149
9. 1	90	9. 50	124	10. 24	150
9. 1	92	9. 52	126	10. 26	152
9. 2	93	9. 54	128	10. 28	153
9. 2	97	9. 56	130	10. 30	154
9. 2	99	9. 58	132	10. 32	155
9. 2	102	10	134	10. 34	156
9. 2	105	10. 2	136	10. 36	156
9. 3	105	10. 4	137	10. 38	156
9. 3	108	10. 6	138	10. 40	[2] 157

[1] Load was reduced here, but speed remained.
[2] Gauge on compressor read 161.

Auxiliary air compressor trials: Charge started 1.35 p. m.; broken, 5.35 p. m.; No. I Group, 2 bottles; capacity, 35.30 cubic feet.

Time.	First stage.	Second stage.	Third stage.	Fourth stage.	Volts.	Amperes.	Temperature.
1. 35	2. 2	7. 5	20	25	325	39	66
2. 30	2. 2	7. 5	30	50. 5	325	42	63
3. 30	2. 2	8	30. 2	95	315	50	73
4. 30	2. 2	8	35	125	265	57	71
5. 00	2. 2	8	35. 5	150	265	60	71
5. 35	2. 2	8	40	165	265	60	71

Pressure of stages given in atmospheres. Temperature taken inside motor casing.

Time.	Pressure.	Time.	Pressure.	Time.	Pressure.	Time.	Pressure.
0. 0	14	1. 3	56	2. 3	97	3. 3	133
. 3	16	1. 6	58	2. 6	100	3. 6	135
. 6	18	1. 9	61	2. 9	101	3. 9	137
. 9	20	1. 12	63	2. 12	103	3. 12	139
. 12	22	1. 15	64	2. 15	105	3. 15	140
. 15	24	1. 18	66	2. 18	107	3. 18	142
. 18	26	1. 21	69	2. 21	109	3. 21	143
. 21	28	1. 24	71	2. 24	111	3. 24	145
. 24	30	1. 27	73	2. 27	112	3. 27	145
. 27	32	1. 30	75	2. 30	113	3. 30	147
. 30	34	1. 33	77	2. 33	115	3. 33	149
. 33	36	1. 36	79	2. 36	117	3. 36	150
. 36	38	1. 39	81	2. 39	118	3. 39	151
. 39	40	1. 42	83	2. 42	120	3. 42	152
. 42	42	1. 45	85	2. 45	122	3. 45	153
. 45	44	1. 48	87	2. 48	124	3. 48	154
. 48	46	1. 51	89	2. 51	126	3. 51	156
. 51	48	1. 54	92	2. 54	128	3. 54	157
. 54	50	1. 57	95	2. 57	130	3. 57	158
. 57	52	1. 60	95	2. 60	132	4. 00	160
. 60	54						

DATES FOR COMPLETION OF VESSELS.

March 26, 1920.

BATTLESHIPS.

Name.	Place.	Date.
New Jersey	Boston	Indefinite.
Virginia	do	Do.
Connecticut	Philadelphia	May 15.
Louisiana	do	Indefinite.
Michigan	do	May 15.
Minnesota	do	Do.
New Hampshire	do	Do.
South Carolina	Norfolk	Do.
Georgia	Mare Island	Not set.
Nebraska	do	Do.
Rhode Island	do	Do.
Vermont	do	Do.
Arkansas	Puget Sound	Apr. 30.
New York	do	May 15.
Wyoming	do	Apr. 10.

CRUISERS AND GUNBOATS.

Des Moines	Portsmouth	May 15.
Huntington	do	Indefinite.
Chester (reserve)	Boston	Do.
Frederick	Philadelphia	Do.
Pueblo	do	Not set.
St. Louis	do	Do.
Sacramento	Norfolk	Mar. 31.
Denver	Mare Island	Indefinite.
Montana	Puget Sound	Not set.
North Carolina	do	Do.
Seattle	do	Do.
Wheeling	New Orleans	Indefinite.

DESTROYERS.

Bell	Portsmouth	May 1.
Fairfax	do	Do.
Gridley	do	Do.
Israel	do	Do.
Lansdale	do	Do.
McKean	do	Do.
McKee	do	Do.
Stribling	do	Do.
Taylor	do	Do.
Ausburne (fit out)	Boston	Indefinite.
Conyngham (reserve)	do	Do.
Cowell	do	Do.
Flusser (fit out)	do	Ready.
Foote	do	Indefinite.
Kalk	do	Do.
Kimberly	do	Do.
Luce	do	Do.
Maddox	do	Do.
Meredith	do	Do.
Preble (fit out)	do	Do.
Thornton	do	Ready.
Worden (fit out)	do	Do.
Broome	New York	Apr. 1.
Caldwell	do	Indefinite.

DATES FOR COMPLETION OF VESSELS—Continued.

DESTROYERS—Continued.

Name.	Place.	Date.
Cushing (reserve)	New York	Indefinite.
Dyer (reserve)	do	Do.
Gregory (reserve)	do	Do.
McDougall (reserve)	do	Do.
O'Brien	do	Do.
Sampson (reserve)	do	Do.
Borie (fit out)	Philadelphia	Do.
Harding	do	May 1.
Balch (reserve)	Norfolk	Indefinite.
Benham (reserve)	do	Do.
Connor	do	Do.
Downes (reserve)	do	Do.
Duncan (reserve)	do	Do.
Graham (fit out)	do	Apr. 7.
Haraden	do	Indefinite.
Manley (reserve)	do	Do.
Mason (fit out)	do	Apr. 1.
Parker (reserve)	do	Indefinite.
Semmes (fit out)	do	Ready.
Bush	Charleston	Apr. 5.
Osmund Ingram	do	Indefinite.
Breese	Mare Island	Do.
Elliott	do	Mar. 25.
Greer	do	Do.
Kilty	do	Indefinite.
Lamberton	do	Do.
Lea	do	Mar. 25.
Montgomery	do	Indefinite.
Radford	do	Do.
Tarbell	do	Mar. 25.
Upshur	do	Do.
Yarnall	do	Do.
Dent (reserve)	Puget Sound	Indefinite.
Dorsey (reserve)	do	Do.
Edwards (reserve)	do	Do.
Gwin (fit out)	do	Do.
Rathburne (reserve)	do	Do.
Talbot (reserve)	do	Do.
Waters (reserve)	do	Do.

SUBMARINES AND SUBMARINE TENDERS.

O–3	Boston	Apr. 30.
O–5	do	May 7.
R–13	do	Mar. 24.
R–14	do	Apr. 16.
Rainbow	do	May 28.
Savannah	do	Indefinite.
L–1, 3, 9, 10	Norfolk	Do.
R–3	do	Do.
O–7, 8, 10	Charleston	May 1.
O–6, 9	do	May 15.
L–6	Mare Island	Indefinite.

DATES FOR COMPLETION OF VESSELS—Continued.

FLEET TENDERS (TRAIN).

Name.	Place.	Date.
Rappahannock (reserve)	Portsmouth	July 15.
Mercy	New York	May 15.
Celtic	Mare Island	Indefinite.
Comfort (ord.)	do	Do.

MINE FORCE.

In commission.		
Ortolan	New Orleans	Indefinite.
Baltimore	Mare Island	May 15.
In reserve.		
Auk	Portsmouth	Indefinite.
Chewink	do	Do.
Curlew	do	Do.
Flamingo	do	Do.
Grebe	do	Do.
Osprey	do	Do.
Woodcock	do	Do.
Robin	New York	Do.
Eider	Charleston	Do.
Kingfisher	do	Do.
Lapwing	do	Do.
Penguin	do	Do.
Sanderling	do	Do.
Tanager	do	Do.
Turkey	do	Do.
Whippoorwill	do	Do.
Widgeon	do	Do.
Pigeon	Mare Island	Do.

MISCELLANEOUS.

Patapsco	Portsmouth	May 10.
Patuxent	do	Indefinite.
Aramis	New York	Do.
Bagaduce	do	Apr. 1.
Favorite (reserve)	do	Indefinite.
Kewaydin	do	Do.
Nokomis	do	Do.
Tadousac	do	Do.
Annapolis	Philadelphia	Do.
Hancock	do	Mar. 25.
Hannibal (reserve)	do	Indefinite.
Conestoga	Norfolk	Do.
Despatch	do	Apr. 15.
Jupiter	do	Indefinite.
Navajo	Pearl Harbor	Do.
Vicksburg	Puget Sound	Do.

DATES FOR COMPLETION OF VESSELS—Continued.

NAVAL OVERSEAS TRANSPORTATION SERVICE.

Name.	Place.	Date.
Caesar	Norfolk	Indefinite.
Gulfport	do	May 1.
Mars	do	Indefinite.
Ramapo	do	Apr. 2.
Kittery	Charleston	Apr. 10.
Nero	do	June 2.
Arethusa	New Orleans	Indefinite.
R. L. Barnes	Pearl Harbor	Do.

OTHER GOVERNMENT DEPARTMENTS—UNITED STATES ARMY.

Delaware	Philadelphia	Indefinite.
Manhattan	do	Do.
Donovan	New Orleans	Do.
New Orleans	do	Do.
Taber	do	Do.

UNITED STATES SHIPPING BOARD.

George Washington	Boston	June 30.
Plainsfield	do	Indefinite.
Bellingham	New York	Do.
Martha Washington	do	Apr. 15.
Lake Gedney	Philadelphia	Indefinite.
Nockum	do	Do.
Sequoia	Mare Island	Do.

UNITED STATES COAST GUARD.

Seneca	New York	Indefinite.
Bear	Puget Sound	Apr. 2.

PUBLIC HEALTH SERVICE.

James W. Wadsworth	New York	Indefinite.

PRIVATE PARTIES.

Cauchy	New Orleans	Indefinite.

BATTLESHIPS OUT OF COMMISSION.

Name.	Place.	Name.	Place.
Coast B. S. No. 1 [1]	Philadelphia.	Coast B. S. N. 4 [1]	Philadelphia.
Coast B. S. No. 2 [1]	Do.	Missouri [1]	Do.

BATTLESHIPS UNDER REDUCED COMMISSION.

Alabama [2]	Philadelphia.	Louisiana [1]	Philadelphia.
Connecticut	Do.	Maine [2]	Do.
Illinois [2]	Do.	Michigan	Do.
Kearsarge [2]	Do.	Minnesota	Do.
Kentucky [2]	Do.	Wisconsin [2]	Do.

CRUISERS AND GUNBOATS OUT OF COMMISSION.

Dubuque [3]	Portsmouth.	Monadnock [4]	Olongapo.
Paducah [3]	Do.	Castine [4]	New Orleans.
Isla de Luzon [4]	Newport.	Cincinnati [4]	Do.
Ozark [1]	Philadelphia.	Mariette [4]	Do.
Tonopah [1]	Do.	Petrel [4]	Do.
Standish [4]	Norfolk.	Wheeling	Do.
Wasp [4]	Do.	Bay Ocean [4]	Mare Island.
Winchester [4]	Do.	Machias [4]	Do.
Nashville [1]	Charleston.	Marblehead [1]	Do.
Raleigh [4]	Do.	Rainier [4]	Do.
Tallahassee	Do.	Supply	Do.
Topeka	Do.	Yorktown [4]	Do.

TORPEDO BOATS OUT OF COMMISSION.

C. T. B. No. 1 (Foote) [1 4]	Philadelphia.	C. T. B. No. 9 (Somers) [1 4]	Philadelphia.
C. T. B. No. 2 (Rodgers) [1 4]	Do.	C. T. B. No. 11 (Barney) [1 4]	Do.
C. T. B. No. 3 (Dupont) [1 4]	Do.	C. T. B. No. 12 (Biddle) [1 4]	Do.
C. T. B. No. 4 (Dahlgren). [1 4]	Do.	C. T. B. No. 14 (Delong) [1 4]	Do.
C. T. B. No. 6 (Morris) [1]	Newport.	C. T. B. No. 16 (Thornton). [1 4]	Norfolk.

EAGLE BOATS IN ORDINARY.

Eagle No. 2	Portsmouth.	Eagle No. 38	Portsmouth.
Eagle No. 3	Do.	Eagle No. 39	Do.
Eagle No. 9	Do.	Eagle No. 41	Do.
Eagle No. 13	Do.	Eagle No. 42	Do.
Eagle No. 18	Do.	Eagle No. 44	Do.
Eagle No. 19	Do.	Eagle No. 45	Do.
Eagle No. 23 [5]	Do.	Eagle No. 46 [5]	Do.
Eagle No. 24	Do.	Eagle No. 47	Do.
Eagle No. 26	Do.	Eagle No. 48	Do.
Eagle No. 27	Do.	Eagle No. 50	Do.
Eagle No. 28	Do.	Eagle No. 51	Do.
Eagle No. 29	Do.	Eagle No. 52	Do.
Eagle No. 34	Do.	Eagle No. 54 [5]	Do.
Eagle No. 35	Do.	Eagle No. 55	Do.
Eagle No. 36	Do.	Eagle No. 57 [5 6]	Do.
Eagle No. 37	Do.	Eagle No. 59	Do.

[1] No work being done.
[2] To be placed out of commission.
[3] General repairs.
[4] To be sold.
[5] In full commission.
[6] Fitting out for Alaskan patrol.

SUBMARINES OUT OF COMMISSION.

Name.	Place.	Name.	Place.
U-117 [1]	Philadelphia.	C-1, 2, 3, 4, 5 [2]	Coco Solo.
U-140 [1]	Portsmouth.	A-2, 4, 6, 7 [2]	Cavite.
UC-97 [1]	Chicago.	B-2 [2]	Do.
UB-88 [1]	San Pedro.	G-1 [3]	Philadelphia.
UB-148	Philadelphia.		

SUBMARINES AND SUBMARINE TENDERS IN RESERVE.

D-1, 2, 3 [4]	New London.	O-11, 12, 13, 14, 15, 16 [5]	Philadelphia.
E-1, 2 [4]	Do.	F-2, 3 [4]	San Pedro.
G-3 [4]	Do.	Rainbow	Boston.

SUBMARINES IN ORDINARY.

A-3, 5 [6]	Cavite, P. I.	B-3 [6]	Cavite, P. I.

SUBMARINE CHASERS UNDER REDUCED COMMISSION.

No. 63	New Orleans.	No. 264	New Orleans.
No. 64	Do.	No. 330	Do.
No. 190	Do.	No. 331	Do.
No. 191	Do.		

VESSELS TO BE PLACED OUT OF COMMISSION IN NEAR FUTURE.

Nokomis	New York.	Elcano [2]	Asiatic Station.
Yankton	Do.	Pampang [2]	Do.
Charles [2]	Philadelphia.	Quiros [2]	Do.
Warbler	Do.	Samar [2]	Do.
Willett	Do.	Villalobos [2]	Do.
Yale	Do.	Isabel [1]	Philadelphia.
Jupiter	Norfolk.		

REDUCED COMMISSION OR ORDINARY.

Rappahannock [5]	Portsmouth.	Favorite [5]	New York.
Chester [5]	Boston.	Hannibal [5]	Philadelphia.
Caesar [5]	Norfolk.	Comfort [5]	Mare Island.

DESTROYERS OUT OF COMMISSION.

Ammen	Philadelphia.	Monaghan	Philadelphia.
Beale	Do.	Patterson	Do.
Burrows	Do.	Paulding	Do.
Drayton	Do.	Perkins	Do.
Fanning	Do.	Roe	Do.
Henley	Do.	Sterrett	Do.
Jarvis	Do.	Terry	Do.
Jenkins	Do.	Trippe	Do.
Jouett	Do.	Walke	Do.
Mayrant	Do.	Warrington	Do.
McCall	Do.		

[1] Being dismantled.
[2] To be sold.
[3] Target for depth charge experiments.
[4] Elemental submarine school work.
[5] General repairs.
[6] No work being done.

OLD DESTROYERS OUT OF COMMISSION AND BEING SOLD.

Name.	Place.	Name.	Place.
Hopkins	Philadelphia.	Smith	Philadelphia.

SUMMARY BY NAVY YARDS OF SHIPS UNDER REPAIR.

Place.	Date.	Place.	Date.
PORTSMOUTH, N. H.		NEW YORK.	
4. Des Moines	May 15.	2. Broome	Apr. 1.
Huntington	Indefinite.	Caldwell	Indefinite.
3. Bell	May 1.	Cushing (reserve)	Do.
3. Fairfax	Do.	Dyer (reserve)	Do.
3. Gridley	Do.	6. Gregory (reserve)	Do.
3. Israel	Do.	McDougall (reserve)	Do.
3. Lansdale	Do.	O'Brien	Do.
3. McKean	Do.	Sampson (reserve)	Do.
3. McKee	Do.	1. Mercy	May 15.
3. Stribling	Do.	Robin (reserve)	Indefinite.
3. Taylor	Do.	Aramis	Do.
1. Rappahannock (reserve)	July 15.	3. Bagaduce	Apr. 1.
Auk (reserve)	Indefinite.	Favorite (reserve)	Indefinite.
Chewink (reserve)	Do.	5. Kewaydin	Do.
Curlew (reserve)	Do.	Nokomis	Do.
Flamingo (reserve)	Do.	4. Tadousac	Do.
Grebe (reserve)	Do.	Bellingham	Do.
Osprey (reserve)	Do.	Martha Washington	Apr. 15.
Woodcock (reserve)	Do.	Seneca	Indefinite.
2. Patapsco	May 10.	Jas. W. Wadsworth	Do.
2. Patuxent	Indefinite.		
BOSTON.		PHILADELPHIA.	
		1. Connecticut	May 15.
		5. Louisiana	Indefinite.
7. New Jersey	Indefinite.	1. Michigan	May 15.
7. Virginia	Do.	1. Minnesota	Do.
5. Chester (reserve)	Do.	1. New Hampshire	Do.
Ausburne (fitting out)	Do.	Frederick	Indefinite.
Conyngham (reserve)	Do.	Pueblo	Not set.
Cowell	Do.	St. Louis	Do.
Flusser (fitting out)	Ready.	Borie (fitting out)	Indefinite.
Foote	Indefinite.	2. Harding	May 1.
Kalk	Do.	Annapolis	Indefinite.
Kimberly	Do.	Hancock	Mar. 25.
Luce	Do.	Hannibal (reserve)	Indefinite.
Maddox	Do.	Delaware	Do.
Meredith	Do.	Manhattan	Do.
Preble (fitting out)	Do.	Lake Gedney	Do.
4. Thornton	Ready	Nockum	Do.
Worden (fitting out)	Do.	3. Beaver. [1]	
O–3	Apr. 30.	4. Destroyers (fitting out).	
O–5	May 7		
R–13	Mar 24.	NORFOLK.	
R–14	Apr. 16.		
1. Rainbow	May 28.	1. South Carolina	May 15.
2. Savannah	Indefinite.	3. Sacramento	Mar. 31.
George Washington	June 30.	Balch (reserve)	Indefinite.
Plainsfield	Indefinite.	Benham (reserve)	Do.
3. Submarines		Connor	Do.
4. Destroyers (fitting out).		Downes (reserve)	Do.
6. Other destroyers		Duncan (reserve)	Do.

[1] To be sent to this yard for work.

SUMMARY BY NAVY YARDS OF SHIPS UNDER REPAIR—Continued.

Place.	Date.
NORFOLK—continued.	
Graham (fitting out)	Apr. 7.
Haraden	Indefinite.
Manley (reserve)	Do.
Mason (fitting out)	Apr. 1.
Parker (reserve)	Indefinite.
Semmes (fitting out)	Ready.
L–1, 3, 9, 10	Indefinite.
7. R–3	Do.
Conestoga	Do.
6. Despatch	Apr. 15.
Jupiter	Indefinite.
Caesar	Do.
4. Gulfport	May 1.
5. Mars	Indefinite.
2. Ramapo	Apr. 2.
8. Destroyers (fitting out).	
9. Other destroyers, submarines, eagle boats.	
CHARLESTON.	
Bush	Apr. 5.
Osmund Ingram	Indefinite.
1. O–7, 8, 10	May 1.
1. O–6, 9	May 15.
Eider (reserve)	Indefinite.
Kingfisher (reserve)	Do.
Lapwing (reserve)	Do.
Penguin (reserve)	Do.
Sanderling (reserve)	Do.
Tanager (reserve)	Do.
Turkey (reserve)	Do.
Whippoorwill	Do.
Widgeon (reserve)	Do.
1. Kittery	Apr. 10.
2. Nero	June 2.
3. Mine sweepers, Pacific Fleet.	
4. Destroyers.	
NEW ORLEANS.	
2. Wheeling	Indefinite.
3. Ortolan	Do.
1. Arethusa	Do.
Donovan	Do.
New Orleans	Do.
Taber	Do.
Cauchy	Do.

Place.	Date.
MARE ISLAND.	
Georgia	Not set.
Nebraska	Do.
Rhode Island	Do.
6. Vermont	Do.
5. Denver	Indefinite.
Breese	Do.
Lamberton	Do.
Montgomery	Do.
Radford	Do.
Elliott	Mar. 25.
Greer	Do.
Kilty	Indefinite.
Lea	Mar. 25.
Tarbell	Do.
Upshur	Do.
Yarnall	Do.
3. L–6	Indefinite.
1. Celtic	Do.
Comfort (ordnance)	Do.
3. Baltimore	May 15.
Pigeon (reserve)	Indefinite.
Sequoia	Do.
2. Brutus [1]	
4. Destroyers	
PUGET SOUND.	
1. Arkansas	Apr. 30.
1. New York	May 15.
1. Wyoming	Apr. 10.
Montana	Not set.
North Carolina	Do.
Seattle	Do.
Dent (reserve)	Indefinite.
Dorsey (reserve)	Do.
Edwards (reserve)	Do.
Gwin (fitting out)	Do.
Rathburne (reserve)	Do.
Talbot (reserve)	Do.
Waters (reserve)	Do.
4. Vicksburg	Do.
Bear	Apr. 2.
3. Texas [1]	
2. Bath [1]	
5. Destroyer Division 14	
PEARL HARBOR.	
Navajo	Indefinite.
R. L. Barnes	Do.

[1] To be sent to this yard for work.

NOTE.—The number placed before the names of vessels indicates the order of priority.

OFFICE OF NAVAL INTELLIGENCE.
NAVY DEPARTMENT.
Washington, D. C.

MONTHLY INFORMATION BULLETIN.

NUMBER 5—1920.

15 MAY, 1920.

DISTRIBUTION:

In general: Bureaus of the Navy Department; all force commanders; all commanding officers of capital ships, the larger patrols, destroyers, submarines, and Navy transports.

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1920

CONFIDENTIAL.

OFFICE OF NAVAL INTELLIGENCE.

MONTHLY INFORMATION BULLETIN.

NUMBER 5—1920—15 MAY 1920.

FOR CONVENIENCE IN ROUTING.

Officer.	Initials.	Date received.	Date forwarded
CAPTAIN			
EXECUTIVE OFFICER			
FIRST LIEUTENANT			
NAVIGATING OFFICER			
GUNNERY OFFICER			
COMMUNICATION OFFICER			
ENGINEER OFFICER			
MEDICAL OFFICER			
SUPPLY OFFICER			
FIRST DIVISION OFFICER			
SECOND DIVISION OFFICER			
THIRD DIVISION OFFICER			
FOURTH DIVISION OFFICER			
FIFTH DIVISION OFFICER			
MARINE OFFICER			

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MISCELLANEOUS.

STATEMENT OF THE FIRST LORD OF THE ADMIRALTY EXPLANATORY OF THE NAVY ESTIMATES, 1920–21.

Source: Reliable.

(12855-A.)

The estimates for 1920–21 amount to £84,372,300, as compared with 1919–20 estimates, together with the supplementary estimate, amounting to £157,528,810.

This total provides for—

(*a*) the liquidation of the terminal expenses of the war, which consist of expenditure already incurred, or to which the admiralty are committed, estimated at £19,077,000;

(*b*) separation allowances estimated to cost £3,915,000;

(*c*) expenditure of abnormal or quasi-war character arising out of temporary obligations, such as the maintenance of an adequate force in the eastern Mediterranean and the Black Sea until peaceful conditions are reestablished in those regions, estimated to cost about £500,000; and

(*d*) the maintenance during the coming year of a fleet of the minimum strength which, in the opinion of the Board of Admiralty, can be regarded as providing in present circumstances for the security of the Empire.

Owing to the great increase of salaries, pay, wages, and pensions, and in the prices of materials of every description since 1914, a direct comparison with the prewar estimates is of little value. An analysis, however, of the gross expenditure of £96,490,181 estimated to be incurred in 1920–21, shows that it can be approximately divided into—

(*a*) Nonrecurrent war liabilities or terminal charges	£19,077,000
(*b*) Recurrent expenditure due to war conditions, e. g., increase in prices and in rates of wages, pensions, &c., and separation allowance	40,023,200
(*c*) Normal expenditure on basis of prewar rates and prices	37,489,981

On this basis, the following comparison of the gross estimate for 1914–15 with the gross estimate for 1920–21 can be made:

1914–15:		
Gross estimate		£53,573,261
Deduct amount included for new construction		18,373,000
		35,200,261
1920–21:		
Gross estimate		96,590,181
Deduct war liabilities including new construction	£19,077,000	
Deduct recurrent expenditure due to war conditions	40,023,200	
		59,100,200
		37,489,981

The increase of approximately £2,290,000 over the provision required in 1914–15 is due mainly to the following causes:

The grant of clothing allowances to men of the fleet.

Provision of larger hospital ships.

The extension of scientific research and of technical training.

Reduction in the hours worked by the industrial staff.

Increase in noneffective charges.

The above comparison takes no account of the greater extent to which stocks will be used without replacement during 1920–21 as compared with 1914–15. Against this, however, must be set the fact that a considerable expenditure will be incurred in 1920–21 in building up reserves of victualing and clothing stores, medical stores, oil fuel, and in the provision of new types of shell and ammunition consequent on experience gained in the early part of the war.

The number that we propose shall be voted in vote A, for the maximum number of the personnel of the fleet to be borne on any day during the financial year is 136,000, as compared with 151,000 in 1914–15. The numbers at the date of the armistice were 407,316, and by November, 1919, had been reduced to 157,000. The actual number required for the reduced fleet which it is proposed to maintain during the year is 127,500; but the provision under vote 1 for the pay of the fleet has been based on the assumption that 131,000 officers and men will still be borne at the end of the year, as it can not be expected that all those who are surplus to our reduced requirements can be disposed of during 1920–21.

There is great difficulty in suddenly effecting large decreases or increases in naval personnel, and the reduction of over 25,000 officers and men in the 17 months from last November to April, 1921, will, if accomplished as we hope, be a remarkable feat. It must be

remembered that the crew of a ship is made up of numerous small groups of individuals of many trades—gunnery ratings, torpedo ratings, engine-room ratings, signal ratings, electricians, armorers, mechanics of many kinds, and so on, each group possessing entirely distinct qualifications and having an entirely distinct duty, but each absolutely essential to the fighting efficiency of the ship. In every adjustment of naval personnel provision has been made for each of these numerous branches of skilled men to be kept up to strength in every ship all over the world. Any attempt to wash out naval personnel with a broad brush at once immobilizes far more units of the fleet than was ever intended.

The time is opportune for an explanation of some of the principal decisions which the Board of Admiralty have taken, and of the motives by which they have been guided, while framing these estimates, which may perhaps be described (in spite of the considerable provision for war commitments which they embody) as the first of the new series of peace estimates. I therefore append some notes on naval policy and a note on dockyard policy. It should be understood that these statements do not purport to be exhaustive even of the decisions already taken, still less of the matters which are engaging the attention of the board.

Notes on Naval Policy.

1. During the past year it has not been possible to frame a definite statement on naval policy owing to the changing situation, the necessity for keeping the fleet prepared for eventualities during the armistice period, and the active operations imposed on the navy in the Baltic.

2. It is now possible to estimate more clearly and closely what are the requirements of the future, and to make what, it is hoped, will be regarded as a fairly full statement of our naval commitments and proposals.

3. Since sea power is essential for the security and prosperity of the British Empire, it is the object of the Board of Admiralty to proceed on lines which they believe will provide us with our vital requirements, and at the same time secure the exercise of rigid economy. The expenditure necessary for such a policy is merely an insurance for our existence, and a guaranty of our increased prosperity.

4. In view of the vast efforts made during the years of war, it is possible for us to-day to suspend production for the time being and concentrate largely on assimilating the lessons of the war, the fleet being reduced to minimum requirements as regards both personnel and matériel.

5. In the first place we have certain definite duties to perform in support of allied policy, and to assist in stabilizing the disturbed conditions which at present prevail in the world.

We have also to provide the units necessary for maintaining adequate seagoing training for our personnel.

We have to station small cruiser squadrons on foreign stations, North and South Atlantic, Pacific, Indian, China, and Australian waters, to assist our trade and support the needs of the Empire.

Finally, we have to meet the requirements of technical training to insure progress in modern devices and methods of warfare.

Strength of the Seagoing Fleet.

6. We have based in home waters our main fleet—the Atlantic Fleet, consisting of 1 fleet flagship, 2 battle squadrons (together comprising 9 ships), a battle cruiser squadron of 4 ships (one of which is conveying His Royal Highness the Prince of Wales on his tour of the Dominions), 2 light cruiser squadrons, 4 destroyer flotillas, 3 submarine flotillas, and attendant vessels. This is the least number of units to insure progressive tactical and sea training. A lesser number would destroy the possibility of exercises at sea under realistic conditions; the tactical units would be reduced to such an extent that the problems of gunnery concentration, fleet torpedo tactics, destroyer attacks, antisubmarine tactics could not be studied and practiced; the sea training of officers and men would suffer and progress would cease. To have one fleet in which the lessons of the war can continually be practiced and new tactical methods devised, has been one of our principal objects in maintaining that the Atlantic Fleet should be of the strength laid down.

7. In the Mediterranean we have stationed a squadron of 6 battleships, 1 light cruiser squadron, 1 destroyer flotilla, and attendant vessels. This moderately strong force is, in our opinion, necessary to meet political conditions in the Near East. That this force is not excessive is shown by the fact that it has recently been necessary to detach a squadron from the main or Atlantic Fleet to the Levant, the Mediterranean Fleet being fully employed on other important duties and unable to meet all the demands made upon it.

8. As regards the squadrons on the China, African, North and South American, and East Indies stations, the need of them, which has always been recognized in the past, has never been more urgent than it is to-day, in view of the necessity for reestablishing the internal trade of the Empire, and promoting that with foreign countries. The navy constitutes the police of the seas, and all experience teaches that an efficient navy is the surest guarantee for peace.

Remarks on the Capital Ship.

9. There has been some criticism of the maintenance in commission of the present type of vessels, especially in regard to the capital ship. A contrary policy has been openly advocated, this policy being based, it is presumed, on the idea that the battleship is dead and that submersible and air vessels are the types of the future. The naval staff has examined this question with extreme care, and as a result we profoundly dissent from these views.

10. In our opinion the capital ship remains the unit on which sea power is built up.

So far from the late war having shown that the capital ship is doomed, it has on the contrary proved the necessity for that type. On the German side the whole of the submarine campaign against merchant vessels was built up on the power of the high-sea fleet. On the British side the enemy submarines in no way interfered with the movements of capital ships in carrying out operations; destroyer screens, new methods of attack, and altered tactical movements defeated the submarine.

11. Nor at present could the Board of Admiralty subscribe to the statement that aircraft have doomed the capital ship. Aircraft are certainly of the highest importance in naval tactics, as regards reconnaissance, torpedo attacks, and artillery observation, but their rôle in present circumstances is that of an auxiliary and not of a substitute for the capital ship. The past history of this question must be taken into account; many times has the doom of the battleship been pronounced. The introduction of torpedo craft was believed in certain quarters over 20 years ago to have settled its fate. The Board of Admiralty at the time refused to be carried away by the attractiveness of the idea of building small, cheap torpedo craft instead of battleships, and they proved to be right. History has shown that the introduction of a type to destroy the capital ship has been quickly followed by the evolution of countermeasures which sustain its power.

12. We therefore believe that the battleship must remain the prinicpal unit, and that fleet tactics and tactical training must be carried out with the battle squadron as the main unit. Nevertheless, it must be emphasized that although the battleship remains, its type may require to be altered. Advances in electricity, in the internal combustion engine and in science generally will inevitably necessitate an eventual change of type, and it is one of the principal functions of the naval staff to keep continuous watch on scientific development, with the object of insuring that the type of capital ship designed meets the requirements of the future. It is even possible that the present battleship will change to one of a semisubmersible type,

or even of a flying type, but such types are visions of the far future, not practical propositions of the moment. By gradual evolution and development the types forecasted may arrive, but the immediate abandonment of the capital ship in favor of a visionary scheme of aircraft and submarines, would leave the British nation destitute of sea power and without means of progressive training.

Harbor Establishments.

13. There remains to be considered that part of our fleet organization which deals with harbor establishments. The advance which was made in naval technical science during the war was very great.

Before the war we had no efficient mines, and instruction in mining was neglected; there was no system of mine sweeping or of protection against mines as we now understand it; the various methods of submarine searching and attack had not been explored; the torpedo as a weapon was unreliable. The reason for this unsatisfactory state of affairs it is unnecessary to consider in this statement, but war experience has shown conclusively that if in times of peace we neglect development of these devices and instruction in their use, years of effort and vast expenditure are required to make good that neglect.

14. As a consequence, therefore, while it is desirable that we should keep down to bare minimum requirements the size of the seagoing fleets, it is essential that the navy should possess all information concerning the latest scientific devices and their use; that in the event of war the seagoing fleet should be equipped with the best weapons modern science can provide: that there should be a personnel fully trained in technical science, and that the arrangements should be such that rapid expansion can take place both in equipping the reserve fleet and auxiliary units, and in training the reserve personnel for manning these units. For this purpose it is necessary to provide—

(*a*) Adequate experimental establishments for the development of the latest scientific devices in accordance with the requirements of the staff.

(*b*) Training establishments where the personnel will be fully instructed in the same.

(*c*) Light cruisers, destroyers, and other attendant craft for carrying out practical experiments with the devices developed by the scientific establishments and for giving practical instruction in their use to the personnel.

Scientific Research.

15. The organization of scientific research within the navy which has been set up so as to insure that the latest developments are understood by the naval service, and that development both in types of

vessels and in weapons will keep pace with scientific progress, is given in Appendix II to this memorandum. Under the controller of the navy there has been set up a department of scientific research and experiment. As the scientific adviser of the controller and in charge of this department there has been appointed a director of scientfic research who is responsible for the general direction and organization of research work for naval purposes, keeping the navy in touch with outside scientific establishments and insuring that the work at the various naval experimental establishments dealing with mining, sound signaling, and navigational appliances proceeds with full cognizance of scientific progress and methods. He will arrange for additional scientific assistance being given to these establishments as requisite. Further, the director of scientific research, by keeping in close association with the naval staff, will insure that we are kept full aware of the possible practical application of scientific progress in relation to naval needs, thus enabling us to formulate requirements as to types and weapons with a knowledge of the latest scientific possibilities, and to make ourselves better equipped for dealing with the vital problem of naval material development.

16. Consultations with outside institutions will be resorted to so as to gain the benefit of their research and experiments, but there are some problems which it will not be possible to deal with in this manner, owing to their secret or to their special naval aspect. Special naval problems will be dealt with by the naval establishments—gunnery, torpedo, mining, signaling and antisubmarine—but for research work and secret development it is essential that the naval service should have a small central establishment of its own, independent of the special experimental establishments. Such an establishment was formed during the war at Shandon, and has performed, and is performing, good service. But Shandon is expensive to the country in its upkeep, and suffers from disadvantage in position both in regard to its distance from the naval ports and from the Admiralty with the consequent liability that owing to insufficient cooperation and contact with naval thought, the research work may be conducted without the necessary consideration for practical requirements.

17. It has been decided, therefore, to close Shandon as soon as suitable accommodation can be provided elsewhere. Such work at Shandon as requires sea environment will be removed to existing naval establishments. All pure research work now being carried out at Shandon will eventually be transferred to a small naval institute adjoining the national physical laboratory at Teddington. This institute, under the director of scientific research, will be entirely controlled by the Admiralty, but its close association with the national

physical laboratory will offer exceptional facilities for cooperation, and the scientific staff of the institute will have the advantage of personal acquaintance with the work being carried out in the laboratory. It is hoped to have this establishment ready at the end of the present year; meanwhile Shandon, on a reduced scale, is being kept going until the establishment at Teddington is ready. To stop pure research work altogether at this moment would be a retrograde step, and might conceivably have a serious effect ultimately on development of types of ships and weapons, and on economy generally.

Technical Training.

18. For the technical training of the personnel special schools are established at the naval ports of Portsmouth, Devonport, and Chatham. The schools at Portsmouth are the largest, and attached to each of these schools is an experimental establishment dealing with the work of the school. This general system was in existence prior to the war, except that the experimental establishments were practically nonexistent. As a result of the war, however, and of the progress in scientific and technical thought, large increases became necessary, especially in the establishments at Portsmouth.

19. As already stated, mining was considered in prewar days to be a minor and unimportant branch of naval warfare; the staff dealing with this subject was small, and was attached to the torpedo school.

The utility of mines was emphasized early in the operations of 1914, and the science of mining gradually assumed a position of extreme importance in naval strategy and tactics. On the tactical side as well as on the scientific and material side immense strides were made. This called for staff and technical knowledge of the highest order, and necessitated the setting up of a special mining school at the gun wharf, Portsmouth. This school, though it started late in the war, finally achieved great results, both in its experimental and instructional side. It is essential to keep this school in being.

The mining school at Portsmouth represents an additional establishment for which there was previously no provision. At this school the personnel will be instructed in the science of offensive and defensive mining, and also in devices for protection against mines, including the paravane.

20. Apart from mining, the torpedo and electrical, and signal schools have hall had to be expanded to meet modern requirements. The war was responsibe for tremendous developments, and all these developments have necessitated more advanced instruction for the personnel, and an increased staff to give this instruction. More highly organized scientific and experimental establishments have to be attached to the schools.

21. Another technical branch of the naval service, which did not exist when the war commenced, is the antisubmarine school; the importance of this school in the future can hardly be overestimated. We have seen the great effort which was made by means of the submarine to wrest from us our sea supremacy. Science alone can give us the antidote to the submarine, and we have taken steps, as will be seen in the detailed statement regarding the fleet, to insure progress in experimental work and training. Development in this work will undoubtedly be required to meet the possibilities of the future, and proposals are under consideration for the establishment of a school of antisubmarine work in conjunction with an antisubmarine experimental station.

22. The submarine training establishments themselves have, as a result of the war, become more, rather than less, important. Future developments in the submarine may have a profound effect on naval strategy and tactics. This subject is receiving continuous attention. Experimental work is being pressed forward, and in addition adequate steps are being taken to insure that the high standard of the submarine personnel is maintained. The necessary staff and the attendant vessels shown in Appendix I have been allotted with this purpose in view.

23. It must be emphasized here that the policy with regard to instructional establishments generally has been to insure the provision of an adequate experimental and instructional staff, and of the appliances and seagoing tenders required for carrying out the experimental and instructional work with efficiency.

Personnel.

24. It is upon the efficiency of the personnel that everything finally depends, and the Board of Admiralty are taking such steps as will insure a naval service carrying on the traditions of the past, highly trained in staff and technical work, and will continue to do all in their power to secure conditions which will combine efficiency and contentment.

Entry and Training of Officers.

25. First, as regards the office personnel, it is proposed to adhere to the system known as the common-entry system, by which is meant that the main body of deck officer and engineering officers will be trained in the same cadet establishment. The common-entry system was the system introduced by the Board of Admiralty in 1903, but since its inception it has undergone many modifications, and in explanation of the present policy it is desirable to give in brief outline the existing state of affairs.

26. Whereas in the past there have been two colleges for the training of naval cadets, it is now proposed that there be only one college at Dartmouth, and that the Osborne establishment shall be closed.

One college is capable of dealing with the reduced number of cadets required for the present fleet, and economy will result from the change.

27. The age of entry for naval cadets under the common-entry system will be between 13½ and 14. Consideration has been given to the question of entering boys at a later age, but it has been decided to adhere to the present age as being that at which the majority of boys finish their private school education before proceeding to public schools.

These boys will go to Dartmouth College, which will in effect be the naval public school where general education on naval lines will be continued under a system of education somewhat changed from that under which the common-entry system has hitherto been conducted, in that more attention will be paid to general education, and the large amount of time which was previously devoted to engineering will be reduced. The important factor at the cadet college is to insure that the boys have a thorough groundwork on which to build.

28. The cadets will spend four years at Dartmouth and will then be sent for two terms (eight months) to a training battleship for their practical education and for gaining acquaintance with sea life, afterwards being drafted to sea as midshipmen. As midshipmen they will take their part as officers of the ship to which they are appointed, but their instruction will continue, the majority of their time being spent on their work as deck officers and one-eighth being devoted to engineering.

After one year at sea, those midshipmen who show a special aptitude and liking for engineering will be permitted to volunteer for that branch of the service; such midshipmen will thereafter devote one-third of their time instead of one-eighth, as hitherto, to engineering. The midshipmen not volunteering for engineering will continue to devote only one-eighth of their time to engineering.

29. On reaching the rank of sublieutenant a further opportunity will be given to officers to volunteer for the engineering branch of the service, and from these volunteers and from those who volunteered as midshipmen selections will be made. It may be expected that the majority of officers selected will be from those who volunteer for engineering after serving one year at sea as midshipmen, and who since that time will have devoted a considerable portion of their time to engineering studies.

Officers selected for the engineering branch when sublieutenants will, after going through advanced courses of engineering, be

definitely placed on the engineering side of the profession, and will not revert during the remainder of their career to deck duties. They will rise through the various ranks of the engineering branch, with special rates of pay. High positions of administrative importance and responsibility at sea, at the Admiralty, and in the dockyards will be open to them.

30. It requires to be emphasized that officers selected at this early age will devote the remainder of their career to engineering. It is essential that the majority of officers forming the engineering branch should be "whole-time" officers. There is a definite distinction, both as regards knowledge and capabilities, between those who are to be trained in the science of naval war and strategical and tactical methods of fighting and those who are to deal with the upkeep and maintenance of engineering and mechanical appliances which are necessitated by the complex machinery and weapons of modern war. Each side requires a special study, and for this reason final separation of the branches is essential.

31. At the same time, although there must be this definite division between the deck and engineer officers, each being charged with their own important sphere of responsibility, nevertheless, each branch must understand and sympathize with the requirements of the other. In the exercise of strategy and tactics it is necessary that there should be full understanding of the engineering and mechanical possibilities and difficulties, and how such difficulties can be overcome. On the engineering side it is equally necessary that there should be an understanding of the requirements of the strategist and tactician, in order that so far as practicable his requirements may be met and perhaps anticipated.

By means of the common-entry system and training under a similar system until about the age of 20, when the rank of commissioned officer is reached, it is believed that this sympathy and understanding between deck and engineer officers will be fully and completely obtained.

32. At present there is a further scheme whereby officers, after one year at sea as lieutenant, are eligible to specialize in engineering in the same way as officers specialize in gunnery, torpedo, and navigation.

After from $6\frac{1}{2}$ to 8 years' service as specialists these officers may elect to revert to deck duties, and will be considered for promotion with other deck officers. The efficiency of this scheme, and the necessity for its continuance, is now under consideration and will be decided without prejudice to officers already specialized under its provisions.

33. Briefly, therefore, the system of general training as an officer will be—

(*a*) Common entry at about 13½ years of age.

(*b*) Three years eight months (11 terms) training at Dartmouth.

(*c*) Eight months in a training battleship.

(*d*) About 2½ years at sea as midshipman before becoming a sublieutenant.

(*e*) Midshipmen, after one year at sea, to be permitted to volunteer for engineering and to be given special engineering instruction.

(*f*) Sublieutenants to be permitted to specialize in engineering, officers selected to be turned over to the engineering branch, and to stay for the remainder of their career in that branch.

(*g*) Promotion to lieutenant after serving about one year as sublieutenant, that is about the age of 22.

(*h*) Lieutenants after one year to be permitted to specialize in engineering, such lieutenants to remain from 6½ to 8 years in engineering branch, and then to be permitted to return to the deck branch or to remain in the engineering branch (continuance now under consideration).

(*i*) Promotion to lieutenant commander after 8 years as lieutenant, about the age of 30. Further promotion at approximately the ages and seniorities hitherto customary.

34. Although, as explained in the foregoing, it is the intention that the general age of entry shall be about 13½ years, and that boys so entered shall be sent to Dartmouth, it is highly desirable in the interests of the naval service that there shall be a special form of entry at a later age, so that boys who are not ready at the age of 13½ may still have an opportunity of entering the naval service, and also so as to allow of a certain number of public school and other boys coming into the service, and thus keeping the Navy in touch with the general educational system of the country. To permit this, it has been decided to continue what is known as the special-entry system, that is, a competitive examination between the ages of 17½ and 18½.

35. About 15 special-entry cadets will be taken under existing circumstances annually; these cadets who will already have received a general education will be drafted to a cruiser training establishment, there to learn the special subjects required, and to gain an understanding of the sea. After one year in the training cruiser these cadets will be sent to sea as midshipmen, joining up with the common-entry midshipmen, and thereafter being trained on exactly similar lines. Their time of service as midshipmen will be adjusted so that on reaching the rank of lieutenant, special-entry cadets will as

a whole be not more than one year older than those entered through Dartmouth College. This year's difference in age will make little or no difference to an officer showing zeal and ability; promotion to the rank of commander, and captain being by selection, this year can be more than made good, and, in respect of a subsequent career, boys who enter under special-entry conditions should understand that they suffer no disadvantage as compared with those entering through the main channel.

Reduction of the Officer List.

38. The present position with regard to the number of officers in the naval service is that, as a result of the expansion necessitated by the war, a surplus of officers exist.

Proposals for reducing the lists have been under consideration for some time, and provide for special rates of retired pay with a gratuity to lieutenant commanders over the age of 36, and for a gratuity to lieutenant commanders and lieutenants under that age, and also sublieutenants and midshipmen, who decide to take advantage of this offer and retire voluntarily within six months (or nine months in the case of officers serving abroad) of the promulgation of the order giving full details of the scheme.

39. Officers of commander's rank and above are already eligible to retire with the half pay of their rank. Owing to the considerable reduction in the number of vessels maintained in the fleet, there will be fewer appointments open to officers of this rank, with a corresponding increase in the number unemployed. These will necessarily be placed on half pay.

40. Reductions of the lists of the higher ranks of the service are being effected automatically by retirements in accordance with the regulations.

The adverse effect of the reductions upon the prospects of younger officers is being mitigated by the generous action of distinguished admirals in voluntarily seeking retirement.

41. As regards naval cadets now under training; again, as a result of the war, we have in the Osborne and Dartmouth establishments a large surplus; so much so, in fact, that in every term passing out between July, 1920, and August, 1922, only about 60 per cent of the boys at present forming these terms can actually go to sea.

It has been realized that for these boys we have a special responsibility, in that it is difficult for parents to withdraw them and send them to continue their education at a public school. The boys are in many cases too old to enter public schools, and the public schools themselves, even if the boys were fitted, could not take them owing to having no vacancies.

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It has been decided, therefore, that, in regard to these terms, parents who wish to withdraw their boys at or before the end of the coming summer term, and exercise this option before the 15th of July next, will be granted the sum of £300 in order to continue the boy's education elsewhere; but if the parent prefers that his boy should finish his education—an education which fits him for all walks of life—he may leave the boy at the naval establishment. At each final examination, however, as the parent has been informed, 40 per cent of the boys will not pass into the naval service; such boys will, however, have received a full education, and should be ready to pass on to the university or, with special training, to such professions as may be decided.

42. It must be understood in this connection that the normal regulations with regard to withdrawal of cadets owing to failure to reach an adequate intellectual or physical standard, or through misconduct, will continue to operate, and that in regard to such cadets no gratuity will be paid.

43. The special arrangements for reduction will not be put into effect with regard to the term passing out in April. To apply them to this particular term would be unfair to the parents, owing to the shortness of time between this announcement and the final examination. Also, in the case of the term passing out in July next. the notice of these proposals is inadequate. In the particular case of this term, although only 60 per cent of the boys will proceed to sea, it is proposed that as regards the 40 per cent rejected, the parents of all these cadets should be paid the sum of £300, unless such rejection comes under the normal regulations governing withdrawal referred to in the preceding paragraph.

44. So soon as the reduction of the lists and of the cadets under training has been effected the following will be the general position: Forty cadets will be entered three times a year into Dartmouth College, and 15 cadets annually by means of the special entry. As regards the future prospects of cadets who stay in the service and become lieutenants, it may be expected that the prewar percentage of promotions from lieutenant commander to commander and from commander to captain will be maintained.

Promotion from the Lower Deck.

45. The foregoing gives the general system under which deck and engineer officers for His Majesty's service will be entered and trained. There remains to be considered the system of promotion from the lower deck, which is being devised to insure that men who display conspicuous character and ability shall have the opportunity of reaching the highest ranks of the service.

46. At present, under the regulations of the special-entry examination, a man from the lower deck between the ages of $17\frac{1}{2}$ and $18\frac{1}{2}$ can sit for this examination, and, if successful, he will become one of the special-entry cadets in the ordinary course of events. But owing to the lack of early educational facilities and also to the specialized training received since joining the naval service as boys, to the detriment of their education in such examination subjects as French and Latin, it is certain that only a small percentage of men could possibly take advantage of the special-entry system. Some other system, therefore, than the special-entry system must be looked to in order to give the lower deck of the Navy the opportunity of reaching high rank, and to enable us to draw a proportion of officers from those who entered as boys on the lower deck.

47. The present "mate system," whereby selected petty officers, provided they have seven years' service, are promoted and receive commissions as mates, and after a series of examinations and further service of two years become lieutenants, was designed to form an avenue of promotion from the lower deck to the commissioned ranks. Many admirable officers have been produced in this manner. But the mate system has suffered from the disadvantage that, owing to the operation of the seven years' service rule, the majority of men promoted to commissioned rank in this manner do not reach the rank of lieutenant until 28–29 years of age or even later. When it is considered that an officer entering under normal conditions reaches the rank of lieutenant at about 22 years of age, it will be seen that under this system there is little chance of a man promoted from mate reaching a higher rank than lieutenant commander.

48. To remedy this state of affairs, and to give a real opportunity to all men, a certain number of vacancies in each year will be available for men from the lower deck who may wish to become officers.

49. A man reaching the age of 21, provided he has satisfied the requirements of a sea selection board and has passed the seamanship examination for officer's rank, and has further taken a first-class certificate in the special educational test, embracing mechanics, geometry, history, physics, and general subjects, will be eligible for selection before an Admiralty selection board. Those selected to fill the vacancies available will become acting mates, the earliest age being 21. Provided a man takes a first-class certificate in the further special courses he will undergo, he can become a lieutenant at the age of 23. Candidates who take lower class certificates will be required to serve a longer period at sea before promotion to lieutenant, the same procedure being followed in this respect as with Dartmouth College or special entry officers passing for lieutenants.

49. A man, therefore, who takes a first-class certificate can be promoted to lieutenant at about the same age as a special-entry cadet can reach that rank. He will then be on a precisely similar footing to other lieutenants with regard to promotions, the highest ranks being within his reach.

50. In connection with this development of the mate system, it is intended that those candidates who have been selected shall go through a special course designed to inculcate into them the essential quirements of an officer—knowledge of discipline, maintenance of morale, and capacity for command of men; hitherto men promoted from the lower deck have not had such a course. War experience has certainly shown the necessity for it, and in this respect the navy can not do better than adopt the methods so successfully practiced by the sister service, which, as explained by the Secretary of State for War, during the last months of the struggle produced 95 per cent of the officers for the army.

51. The above gives briefly in outlines the proposals of the Board of Admiralty for insuring that a proportion of the deck officers of the navy shall be drawn from the boys' establishments and from those who have served on the lower deck. An analogous system is being applied to the engineering branch as well; it will insure to all the opportunity, which is their right, of reaching a high rank in His Majesty's service.

52. It is not, however, the intention to rest here; it is hoped in the future to make further proposals with the object of broadening the field of entry and of removing the restrictions which financial contributions impose upon the promising lad who may display the qualities necessary in an efficient naval officer.

University Training of Naval Officers.

53. There remains to be considered the higher education of the officers of His Majesty's service. Before the war this education was almost entirely professional and technical. Officers in their sublieutenant's examination were required to pass examinations in various technical subjects. Later, they specialized in gunnery, torpedo, or navigation, and went to special schools for this purpose, where their higher technical education was completed.

54. The whole of this question of higher education has been carefully reviewed in the light of war experience, and it appears that though the former system gave a type of officer of high professional attainments, yet, in many respects, it has left considerable room for improvement, the nature of the courses being rather too strictly professional and technical. Consequently, in certain respects, the naval officer was at a disadvantage as compared with his contemporaries in other walks of life, who had had the advantage of

a more general education, and had come into contact with all shades of thought up to a comparatively late age.

55. The effect of the war was, in the case of the younger officers, seriously to interfere with their actual general education at the Osborne and Dartmouth Colleges prior to coming to sea, nor was it possible, in the case of a large number of officers, to arrange for the special courses prior to their becoming lieutenants. At the close of the war, therefore, these officers found themselves at a serious disadvantage, first, from the interruption of their general education, and secondly, from the fact that they had been unable as sublieutenants to pass through the courses at Greenwich College and the various naval schools.

56. To remedy this state of affairs the authorities at Cambridge University were approached. The university authorities showed the greatest sympathy and gave us the most generous assistance, and as a result all those officers who had their studies interrupted by the war are being given a special course at Cambridge University. This course is designed to broaden the outlook on life and to bring officers into contact at an impressionable age with university thought and university ideas. It will not be until 1922 that all officers who had their studies interrupted will have been through Cambridge; meanwhile, we are convinced of the enormous benefit which has already resulted to those officers who have been through the course. We are grateful in the extreme for the help which has been given; it has shown the value to the navy of this contact with the university, and it would be a profound mistake if this contact ceased so soon as the officers concerned have passed through their course.

57. It is in contemplation to frame a scheme, subject to the concurrence of the university authorities, under which in the future a university course will be an integral part of training for about 25 per cent of the sublieutenants in each year. It is considered that about this percentage will gain real and lasting benefit from the course.

58. The full details of this scheme of training will be worked out during the coming months. Broadly, the proposals are that all sublieutenants shall undergo, in addition to the technical course of gunnery, torpedo, pilotage, and navigation, a special course of mathematics and physics, and an elementary war course at Greenwich. In this elementary war course, to which great importance is attached, sublieutenants will be given an introduction to strategy, tactics, and the study of war. After Greenwich 25 per cent will be selected for the special university course, the remainder passing to seagoing ships prior to promotion to lieutenant.

Staff Training.

59. In the interests of the future of the service great importance attaches to the selection and training of officers for the war staff. A body of officers is required who have made special study of the lessons of history and of the war, and who are capable of sifting and applying the mass of evidence available.

60. Reduction of the navy to the utmost limit in ships and material makes it the more important that the efficiency of the war staff shall be of the highest order, and that during the forthcoming years there shall be passed through the staff college a number of young officers whose training in staff work will insure a common doctrine on strategical and tactical questions, the right application of the lessons of the past, and the ability to foresee the requirements of the future.

61. With this end in view a naval staff college has been set up at Greenwich. The first course commenced in June last and will be completed in June of the present year. In the next course, commencing in September, the number of officers will be increased and will, it is hoped, include representatives from the Dominions.

62. We must aim at training at least 40 naval officers a year, so that in 10 years 400 will have qualified for the naval staff and will be distributed through the various grades of the naval service. It is further highly desirable that the number of army, air force, and Dominion representatives attending the naval staff college should be increased to insure close cooperation between the services, and to build up the naval thought of the Empire on the common doctrine on which the navy must prepare itself. To carry this out it will be necessary to consider methods of increasing the staff college accommodation; this matter is receiving serious attention, and it is hoped that a decision will be reached in time to enable the staff course in 1921 to be of the dimensions proposed; the matter will be referred to in the naval estimates of 1921–22.

63. For the benefit of senior officers who are unable to take advantage of the staff course, a war college has been opened at Greenwich and a special staff appointed for instructional purposes. Strategy, tactics, and command are the principal subjects dealt with. The course at the war college will be preceded by technical courses at Portsmouth dealing with the use of weapons and progress in weapon technique. The war college at Greenwich opened on 1st March.

War Staff Organization, Admiralty.

64. As it exists to-day, the war staff at the Admiralty, it is correct to say, is largely a war product. Before the war the staff consisted of the intelligence division, operations division, and mobilization division. No "policy" or "planning" division had then come into being,

and no division of the staff dealt with the tactical side of naval war, types of ships, and use of weapons. The exigencies of war brought about an expansion of the Admiralty, including the division dealing with the operations and requirements of war, and emphasized the need for separating operational work on the one side from the work of administration and supply on the other. The reforms were carried out by the Admiralty under war conditions, and as a consequence certain logical divisions of duty in the naval staff organization could not be effected.

65. The main consideration on which we have worked in improving the Admiralty staff organization has been to strengthen that side of the staff which deals with the use of employment of weapons, the tactical questions consequent on change of weapons, types of vessels necessary to carry out naval policy, and staff questions dealing with scientific research and experiment. The staff view on these matters must be kept in the forefront, otherwise there is the danger that requirements of design and supply will dictate the principles relative to use and employment, resulting in the weapon becoming the master and not the servant of the tactician.

66. The war has enabled us to test the weapons forged during a century of peace, and has shown that some of them were unsuitable and inadequate. It is clear that the reason they were so was not so much the fault of the design or manufacture as that the designers are now shown to have been incorrectly or incompletely advised as to the fighting requirements of the moment.

67. In order that progress in naval material may be steady, consistent, and well judged, and not impulsive and jerky, it must be based on continuous study and coordination of the lessons of war, and of experience and progress of our scattered fleets in their peace exercises and practices. The design of our ships must not and should not depend on the impulse of an individual nor merely on the mechanical possibilities of the moment, though the latter must necessarily limit the immediate accomplishment of our whole aim. Design must primarily depend on closely reasoned "requirements," based on evidence continuously and steadily accumulated from the lessons of our fleets, for whose use the ships and weapons are to be supplied. The aim must, and necessarily will, be always in advance of what can be provided by the science of the day.

68. The work thus indicated is the work of the staff, and certain divisions of the staff are therefore being grouped under the assistant chief of the naval staff to deal with questions relating to the use of weapons, types, and designs to meet future developments, cooperation of aircraft and their employment in naval war, weapon technique, and the introduction of new weapons. In fact the as-

sistant chief of the naval staff will be responsible under the chief of the naval staff to the first lord for dealing with all staff questions affecting battle tactics and fighting efficiency.

69. The divisions of the naval staff dealing with operations, policy, intelligence, and training have been similarly placed under the deputy chief of the naval staff, the accepted principle of organization that current work and future work shall not be dealt with by the same division being closely adhered to. Under the operations division will come all those matters of current importance affecting the movements of ships and defense of ports, while the policy division will investigate future strategical questions, strengths of fleets, and development of dockyard and other facilities to meet future requirements, in accordance with the policy laid down by His Majesty's Government.

70. Briefly, then, the organization of the naval staff to meet peace requirements is as follows: At the head of the naval staff is the chief of the naval staff, responsible to the first lord for the fighting efficiency of the fleet and the strategic and operational instructions to carry out policy. Under the chief of the naval staff, the deputy chief of the naval staff on the one side is responsible for operations, policy, intelligence, and training, and the assistant chief of the naval staff on the other side is responsible from the staff side for the development and use of material, including types of vessels, weapons, and tactics.

71. Under this organization war experience will be fully laid to heart, and the lessons applied to naval training and naval progress. Further, by these means the staff is reduced to the minimum numbers compatible with efficiency, while at the same time rapid expansion on sound lines is allowed for in the event of emergency. From an organization consisting of 10 divisions with a personnel of 340 the new organization will shortly consist of 8 divisions with a personnel of about a quarter of that number. They should supply a sufficient personnel to study and apply the results of our experience, and by neglect of that experience there would be a real danger of embarking on expenditure on wrong lines, the building of wrong types of vessels, incorrect tactics, and a faulty training of the personnel.

War Staff Organization—Sea Commands.

72. The war staff in all sea-going commands and at the harbor establishments have been organized on similar principles, with reduced staffs according to the size of the command. As with the Admiralty staff, it is correct to say that before the war the staffs at sea were only partially developed. There was a tendency for study of the technic of naval weapons to overshadow study of their employment.

73. War experience necessitated a change in these methods; and the division of staffs afloat into war staff on the one side, and a technical and administrative service on the other, is now an integral part of the organization of the Navy. As trained war staff officers are produced they will be appointed in their various capacities to fill the positions in these commands. By interchange between officers on the Admiralty staff and the commands afloat, and also by arranging that staff officers are appointed at intervals for general ship duties, leaving their staff work for the time being, it will be insured that touch is kept between the Admiralty and sea thought and sea progress, and also that the staff officers themselves do not become divorced from the general sea service, with a consequent narrowness of outlook unable to appreciate through lack of sea experience the various problems in connection with sea training and the personnel afloat.

74. With the system of training and organization of staffs on these lines, it is considered that the high efficiency of the officer personnel is insured; that unity of thought and action will result from a common staff doctrine, and that the full requirements, present and future, will be met with the greatest efficiency and the greatest economy.

The Navy and the Air.

75. We recognize fully that future naval policy is profoundly affected by possible developments in the air. All classes of aircraft employed as adjuncts to naval warfare have already shown the great effect they exercise in naval tactics and reconnaissance, and in combined operations. Looking ahead, it is possible to foresee tremendous developments in the air which may revolutionize eventually our present conception of sea warfare and sea strategy. But while giving the utmost consideration to the experience already gained, it is vital to this Empire that it should not be carried away by hasty proposals into the belief that air power is already a substitute for sea power. That day may come, but it is not at present in sight; and in the meantime to give way to these false ideas would be to throw ourselves open to grave peril, and to leave ourselves without the means of exercising that influence in world affairs which the Navy, as at present constituted, renders possible.

76. Nevertheless, our organization must be such as to enable us to take full advantage of the progress in aerial matters and to appreciate fully the effect of this progress on the art of naval warfare, and to utilize to the utmost extent the combined effect of air power and sea power for the defense of the Empire and the control of our sea communications.

77. The new organization of the Admiralty staff under the assistant chief of the naval staff is especially fitted for dealing with this vital matter. Arrangements have been made with the air ministry for close cooperation between the Admiralty staff and the air staff, and for insuring that the two staffs are conversant with each other's problems and requirements.

78. To remove all misconceptions it should be stated with emphasis that we in no way contemplate a return to a separate naval air service. It is recognized that the air ministry was created by Parliament as a result of war experience to further the development and maintenance of air power, and that to separate entirely from the air ministry that part dealing with the navy would be to retard progress and result in a weakening both in development of material and the training of an air personnel.

79. At the same time it is an essential accompaniment of the establishment of a separate air ministry that the functions of the two departments should be clearly defined, and more especially is this the case with regard to the responsibilities for the conduct of operations.

The Admiralty have represented to the air council that, in their opinion—

(*a*) The operations of all aircraft flown from His Majesty's ships and vessels with whatever object in view—that is to say, not only reconnaissance and artillery observation machines, but also machines which are carrying out operations in the air for offensive and defensive purposes; and

(*b*) All operations carried out by aircraft not flown from ships, but which are being carried out in connection with the command of the sea—that is to say, operations for oversea reconnaissance and for the attack of enemy ships and vessels—

should be under naval control. Dual control would be unworkable. In all matters relating to the command of the sea the Admiralty are and remain the responsible authority.

80. We are working out the scheme outlined by the chief of the air staff and are in correspondence with the air ministry with a view to putting it into effect.

So far as can be foreseen, naval requirements will be met by the proposal ultimately to form a naval wing under the air ministry, with a personnel especially trained for naval work.

81. To assist in the development of this naval wing it is proposed to second officers volunteering for air work to the air service for training and for subsequent service in the naval wing. Such officers as are specially fitted for work in the higher ranks of the air service will, by arrangement with the air ministry, be permitted to continue in the air force, but the majority of officers after their term of serv-

ice in the air force will return to the naval service and continue their naval duties. Thus, in the course of a few years, there will be a body of naval officers who will have had experience in the air service, who will be equipped with knowledge regarding air matters, and who will be able to keep the navy, as a whole, fully up to date in regard to air strategy and air tactics in relation to sea power.

82. Thus by seconding naval personnel to the air force, by an interchange of naval and air force officers between the staff colleges, and by the special organization of the naval staff, the naval service will be prevented from falling behind in air matters through lack of foresight, through ignorance, or through a conservation which refuses to understand the necessity of change consequent on development.

Dominion Naval Forces.

83. Full and detailed reports have been rendered by Admiral of the Fleet Jellicoe as the result of his recent tour, and are understood to be receiving the attention of the Governments of India and the Dominions. It is obvious that they must form a subject of consideration by the next imperial conference. Lord Jellicoe was everywhere received with the greatest warmth, and we believe that much benefit will result to the Empire from his tour and that his work will be remembered with gratitude. The broad problems of imperial defense which are raised in his reports will meanwhile be studied by the naval staff, working in close touch with the imperial general staff and the air staff. Further, in order that the Admiralty may be prepared to deal with every aspect of the problems connected with the development of Dominion navies, the Dominions have been invited to appoint officers to the naval staff of the Admiralty. These officers will in time form an integral part of the naval staff when the measures outlined in regard to training at the naval staff college bear fruit.

Officers of Accountant and Instructor Branches.

84. The committee which was appointed in July last, with wide powers of reference, to consider the position as regards the accountant branch is on the point of making its report. As soon as the report is received, the question of the future conditions of service and scope of employment of the branch will be fully considered by the board.

85. The instructor branch, which was being allowed to die out before the war, is being reconstituted on a wider basis. The instructor officer is being made responsible for the general education arrangements afloat, apart from work of a purely professional character, both as regards junior officers and ratings. It is anticipated that,

apart from the advantages of having an officer of special university training on board, naval education generally will derive benefit from the change.

Welfare Committee.

86. A new experiment was made by the Admiralty last year in the shape of what is known as the welfare committee. Special facilities were given to enable full discussion to take place at the home ports on matters affecting the different branches of the service and the lower deck generally. Subsequently, representatives elected by the men themselves were attached in an advisory capacity to a committee of officers, and a very large number of questions were brought forward and discussed at a series of meetings extending over several months. The report of the committee, which is very voluminous, was made on March 3. Any changes which are decided on after consideration of the report will be promulgated to the fleet in the usual manner. We attach great importance to the operations of this committee, and we hope that, with sympathetic consideration, they may lead to many improvements in matters affecting the well-being of the men.

The Board of Admiralty are much indebted to Admiral Sir Martyn Jerram for the care and sympathy with which he has presided over the deliberations of this committee, in continuation of the work he had previously done in connection with the pay of the lower deck.

Sports and Recreations.

87. A special section has been set up at the Admiralty to supervise physical and recreational training in the service. It is also part of its duty to promote the organization of sports and games, and with this end in views a sports' control board has been set up at the Admiralty, and various sports associations and local sports committees have been formed.

Reserves.

88. The question of the naval reserves has not yet been finally settled.

A committee is considering alterations in the existing arrangements for enrollment, training, and employment, and the organization for rapid expansion on the outbreak of war.

It is therefore not possible to make any announcement at present, but the importance of early decision is recognized and the matter will be pressed.

For the moment it may be sufficient to say that the reserves have fully proved their value during the war, and that it is intended to retain them as part of our peace organization.

Fleet Repairs.

89. To meet the urgent demand for economy, steps have been taken to reduce the dockyard votes to the lowest point compatible with the fighting efficiency of the seagoing fleet. Experience, indeed, may show that this reduction has been carried to a point below that compatible with efficiency. In the meantime less work must be undertaken during the periodical refits of His Majesty's ships, and important alterations must be deferred. Repairs to ships in reserve will be practically confined to docking, with the result that there will be an accumulation of defects to be dealt with later. It must be recognized that more time and expense will be needed to complete ships for sea if required than would be the case were it possible to complete all defects during the current year.

90. The high pressure of the last five years has prevented ordinary running repairs to dockyard machinery and equipment, and although no serious breakdown is anticipated, the estimates allow no margin to meet these arrears.

Notes on Dockyard Policy.

The report of Lord Colwyn's committee on work in His Majesty's dockyards having been presented to Parliament, I take this opportunity of adding a few words in explanation of the present situation in the yards.

Before the war the home dockyards were six in number, viz, Portsmouth, Devonport, Chatham, Pembroke, Sheerness, and Haulbowline, and the number of men employed on shipbuilding and repair work was about 42,000.

We now have seven home dockyards, the great and finely equipped dockyard of Rosyth having been completed during the war.

The number of men employed on shipbuilding and repair work in the home yards at the time of the armistice was 67,800.

This great increase was necessary in order to deal with the urgent repairs of the fleet, which had to be carried on practically continuously day and night by means of double shifts, etc.

The increase was mostly in the engineering trades and in semi-skilled and unskilled labor, and these classes at the time of the armistice were necessarily out of proportion to the numbers of shipwrights and allied trades.

In the months immediately succeeding the armistice, a large amount of urgent work, in fitting out ships for their foreign stations and in connection with the reconditioning of mercantile vessels temporarily added to the Navy during the war, devolved upon the dockyards and kept practically all hands employed.

When this work began to fall off, it became necessary to consider the reduction of dockyard numbers to a normal peace establishment,

in fixing which the effect of the existence of the new yard at Rosyth in drawing away work from the southern yards had of course to be allowed for.

It was decided to effect the necessary reductions in numbers as gradually as possible by a system of regular weekly discharges, preceded by a fortnight's notice, so as to enable men to get employment in the merchant-ship building yards, where the need for additional labor was stated to be urgent. Experience soon showed, however, that the merchant-ship building yards only absorbed a small number of the men so discharged. This was largely due to the impossibility of finding married accommodation in the commercial shipbuilding centers, but partly also to the fact that the surplus dockyard men belonged chiefly to the engineering trades, and to semiskilled and unskilled classes, where the urgent demand in the merchant-ship building yards is for shipwrights and allied trades. Considerable numbers of shipwrights who could ill be spared from the dockyards were set free in the autumn so as to relieve the shortage in the merchant-ship building yards, but this was done at a cost of still further disarranging the proper balance of trades in the dockyards and has added to our difficulties.

In these circumstances His Majesty's Government decided that the discharges from the dockyards should be reduced to a minimum during the winter, and naval work that was originally intended to be deferred until a later date was brought forward so as to keep as large a number as possible employed during the winter months.

Simultaneously, the committee under the chairmanship of Lord Colwyn, was set up to advise on other ways of tiding over the emergency, and has made the valuable report which has recently been laid on the table.

In pursuance of the recommendations of the committee, the Admiralty are taking steps to lay down an oil tanker at Devonport immediately, and a second mercantile ship will be laid down at Pembroke at a very early date. It has been decided, in view of the difficulties of the present situation, not to proceed further with the proposal to lease the latter yard. There is no slip at present available at Portsmouth, and one will not become available there until late in the year, but the question whether a dock could be utilized at an earlier date for laying down a third mercantile ship, is under consideration. A slip is available at Chatham, but the amount of urgent naval repair work employing shipwrights is so large, and the disproportion of trades is so great, that we could not at present start a merchant vessel there without drawing away shipwrights from the commercial yards, a procedure which would not be in the interests of merchant-ship building at the present time. Any further oppor-

tunities, however, of taking in hand work such as is contemplated in the committee's report will be carefully watched for and utilized.

While these measures will undoubtedly mitigate to some extent the severity of the reductions that will have to be reintroduced after the end of this month, I wish to make it clear that, in spite of all that has been done and all that can be done, very heavy discharges will have to be made during the year 1920–21. After the most careful consideration the board are unable to suggest any alternative means of at once meeting the pressing demand for public economy and remedying the serious disproportion of trades in the dockyards.

In the concluding paragraphs of the preceding statement on naval policy, I have made it quite clear that, in the interests of public economy, the board are keeping down naval repair work and other dockyard services to as low a figure as is possible during 1920–21. It will, of course, be pointed out to me that the effect of this policy of economy is to increase the discharges during the same period. It is perfectly true that there is the possible alternative of spending a great deal more money in the dockyards in 1920–21 by bringing forward work that, in our opinion, it may be practicable to leave to a later year, and that in this way we could make it necessary to employ more men. But to resort once more to this process of bringing forward work which would otherwise fall on a later year could only prolong for a short time the maintenance of the present abnormal conditions in the dockyards, and would necessarily be followed by an even greater and more sudden reduction in numbers, at a time, probably, when the present intense activity in commercial shipbuilding will have abated, and when consequently the difficulties of absorption in outside industry would be increased.

APPENDIX I.

Fleet organization.

Atlantic Fleet:

Fleet flagship	Queen Elizabeth.
First battle squadron	Revenge (flagship), Resolution, Ramillies, Royal Oak, Royal Sovereign.
Second battle squadron	Barham (flagship), Valiant, Malaya, Warspite.
Battle cruiser squadron	Hood (flagship), Repulse, Renown (on detached duty), Tiger.
First light cruiser squadron	Delhi (flagship), Dunedin, Danae, Dauntless, Dragon.
Second light cruiser squadron	Caledon (flagship), Carysfort, Cleopatra, Cordelia, Coventry.
Destroyers	Castor (light cruiser), 2 depot ships and 4 flotillas, consisting each of 2 flotilla leaders, and 16 destroyers.

Atlantic Fleet—Continued.

Submarines	Inconstant (light cruiser), 3 flotillas of 7 boats each, with necessary depot ships and tenders.
Aircraft carrier	Argus.
Battleship for fleet gunnery service	Agamemnon.
Mine layer	Princess Margaret.
Trawlers, drifters, and tugs	As necessary for fleet work.

Mediterranean:

Fourth battle squadron	Iron Duke (flagship), Emperor of India, Marlborough, Benbow, Centurion, Ajax.
Third light cruiser squadron	Cardiff (flagship), Ceres, Caradoc, Calypso, Concord, Centaur.
Destroyers	1 flotilla, consisting of 2 flotilla leaders, 16 destroyers, and 1 depot ship.
Aircraft carrier	Pegasus.
Special-service vessel	1.
Danube force	3 river gunboats and 6 motor launches.
Red Sea	2 sloops.

China:

Flagship	Hawkins (light cruiser).
Fifth light cruiser squadron	Cairo, Carlisle, Curlew, Colombo.
Submarines	1 flotilla of 12 boats and 2 depot ships.
Sloops	4.
Gunboats for river work	14.
Aircraft carrier	Ark Royal.
Special-service vessel	1.

Africa:

Sixth light cruiser squadron	Birmingham (flagship), Dublin, Lowestoft.
Sloops	2.
Gunboats for river work	2.

South America:

Seventh light cruiser squadron	Southampton (flagship), Yarmouth, Dartmouth, Weymouth.
Sloop	1.

East Indies:

Fourth light cruiser squadron	Highflyer (flagship), Caroline, Comus.
Sloops	3.
Special service vessel for Persian Gulf.	1.
River gunboats for Tigris and Euphrates.	2.

North America and West Indies:

Flagship	Raleigh (light cruiser).
Eighth light cruiser squadron	Calcutta, Calliope, Constance, Cambrian.
Sloops	2.

New Zealand:

Sloops for South Sea Islands	2.

Local defense flotillas:	
Portsmouth	4 destroyers.
Chatham	4 destroyers.
Devonport	4 destroyers.
Firth of Forth	4 destroyers.
Coast of Ireland	1 sloop and 6 destroyers.
Gibraltar	4 destroyers.
Malta	4 destroyers.
Surveying ships:	
Home service	6.
Foreign service	4.
Patrol, mine-sweeping, training, and fishery-protection squadron.	3 sloops, 7 twin-screw mine sweepers, and 10 trawlers have been detailed for this service.

Training and experimental establishments.

Gunnery schools:	
Portsmouth	1 cruiser, 1 light cruiser, 1 destroyer, 2 trawlers, 1 motor launch, 1 tug, 1 diving tender, 1 monitor.
Chatham	1 battleship, 1 monitor, 1 destroyer, 1 trawler, 1 motor launch, 1 diving tender.
Devonport	1 cruiser, 1 monitor, 1 destroyer, 1 trawler, 1 motor launch, 1 diving tender.
Torpedo schools:	
Portsmouth	1 light cruiser, 4 destroyers, 4 P boats, 4 trawlers, 2 drifters, 2 motor launches.
Chatham	2 destroyers, 1 trawler.
Devonport	2 destroyers, 1 trawler.
Signal and W/T experimental establishment.	1 cruiser, 1 destroyer, 1 P boat, 1 whaler.
Seagoing gunnery ship for qualifying gun layers.	1 battleship, 1 tug, 1 motor launch, 1 drifter.
Navigation school, Portsmouth	3 twin-screw mine sweepers.
Cadet training:	
Seagoing training ships	1 battleship, 1 cruiser.
Dartmouth College	1 destroyer, 1 patrol gunboat, 1 motor launch.
Osborne College	1 torpedo boat.
Antisubmarine training:	
Portland	1 depot ship, 4 P boats, 1 whaler, 1 drifter..
Shandon	3 trawlers, 2 motor launches.
Submarine training:	
Periscope school (Portland)	1 depot ship, 1 sloop, 1 launch, 4 submarines.
Submarine school (Portsmouth)	2 depot ships, 1 sloop, 1 motor launch, 2 launches, 6 submarines.

Reserve Fleet.

Portland	3 battleships, 7 P boats, 8 submarines.
Rosyth	4 battleships, 3 battle cruisers, 1 aircraft carrier, 5 submarines.
Chatham	4 light cruisers, 1 flotilla leader, 18 destroyers, 2 depot ships, 1 repair ship.
Devonport	1 battleship, 3 light cruisers, 2 flotilla leaders, 16 destroyers, 1 depot ship, 1 monitor.
Portsmouth	2 battleships, 3 light cruisers, 2 flotilla leaders, 15 destroyers, 1 depot ship, 6 submarines (attached to *Dolphin*), 32 submarines (laid up).
Central reserve of twin-screw mine sweepers.	42 (including 3 employed with training establishments).

APPENDIX II.

Organization to Secure for the Navy the Full Advantage of Scientific Research and Advice.

To insure that the full benefits of science shall be secured to the naval service, a department of scientific research and experiment has been constituted under the third sea lord and controller.

2. This department is under the charge of a specially selected scientist, with the title of Director of Scientific Research, who will be responsible to the controller for the general direction and organization of research work for naval purposes, and will work in close association with the naval staff.

3. It will be the duty of the department under the director of scientific research—

(*a*) To keep under constant review the progress in scientific knowledge at the universities and in all Government and civil departments, institutions, and establishments in this and other countries where research work is being carried out;

(*b*) To investigate all new scientific principles and developments thus brought to light, with the object of ascertaining whether they are likely to prove of value to the Naval Service; and

(*c*) To act as the normal channel through which outside scientific institutions and workers may be approached with a view to their undertaking research work for naval purposes.

4. The department will also maintain close association with the scientific work being undertaken in the various naval experimental schools, and it will be the duty of the director of scientific research

from time to time to visit these schools, both to insure that development of new or improved methods does not proceed without full consideration of the latest scientific discoveries that may bear upon the problems in hand, and to satisfy himself that scientific methods are being utilized to the most profitable extent.

5. Whilst it is only by the fullest exercise of the policy of "farming out" of problems that overlapping of work will be obviated and expense saved, especially in matters involving chemical research, there will always remain certain problems of especial importance to the navy and maritime world generally, for the solution of which no appropriate outside agency will be readily available. Thus it is essential that the Admiralty should possess some suitable establishment of its own. The complete equipment of the necessary laboratory near London would, however, entail considerable expense, and would, moreover, be wasteful in that the valuable installations would, in general, not be used to their full capacity. It has therefore been decided to provide what, in the circumstances, is considered to be the best and most economical method of meeting naval requirements, namely—to establish a naval research institute of moderate dimensions adjoining the National Physical Laboratory at Teddington. While this institute will be entirely controlled by the Admiralty, its close association with the National Physical Laboratory will offer exceptional facilities for research, and the scientific staff will gain the additional advantage of personal acquaintance with the work being carried out in that laboratory. Doubtless also arrangements can be made for the existing power, lighting, etc., plants at the national physical laboratory to be made available for the use of this naval adjunct.

6. The organization now proposed is also necessary for the purpose of an arrangement whereby, when required, scientists will be lent to naval experimental establishments for particular work, such as—

(*a*) Fundamental research work requiring sea environment.

(*b*) Assisting in the early stages of adapting some new scientific discovery to practical service use.

7. Further, a naval research institute is essential if the scientific work of the department is to remain of the highest order obtainable. It is a common experience among scientific workers that the ideas which mark real progress come during actual work with their own hands, and for this reason, in addition to those already set forth above, a laboratory is necessary wherein the scientific staff may work, and where the director of scientific research may personally investigate such problems as he, by training and experience, is specially fitted to undertake.

8. At present there exists a laboratory at Shandon. This establishment was set up during the war with the primary object of investigating methods of counteracting the enemy's submarine menace. A site was originally chosen on account of its proximity to deep water and of other facilities, but recent developments have shown that the limited and land-locked waters of the Gare Loch, and the distance from the open sea, render Shandon not well suited to the requirements of naval researches.

Apart, however, from its local imperfections, a great objection to the permanent retention of Shandon as the naval research institute lies in its great distance from the experimental schools, the various scientific institutions and the Admiralty, which latter must remain the center of control of scientific work for the Navy.

9. It has accordingly been decided that so soon as suitable accommodations can be provided elsewhere, Shandon is to be abandoned, such work as requires sea environment, together with the scientific personnel associated with it, being removed to a suitable existing naval school, and the remainder, which does not in its early stages require such surroundings, being transferred eventually to the naval research institute.

10. It will be admitted by scientists that their enthusiasm may render them liable to pursue some particularly promising line of research that is revealed in the course of their investigations, and although no doubt of value in the general interests of science, the results may have no particular bearing on the solution of problems likely to be of benefit to the navy. On occasions it may be wise to "give the scientist his head" if, as is essential, we are to possess an organization which will command respect throughout the scientific world; but in order to guard against such tendencies being carried further than is considered justifiable, and to determine what particular line of research should be pursued in the best interests of the service, or the order of precedence in which particular problems should be attacked, the controller is empowered to call to his assistance such outside scientists as he may consider desirable to form an advisory council on which, as a matter of routine, the director of scientific research and representatives of other departments concerned will be invited to sit.

With this object in view, the royal society have already approached and have consented to nominate two suitable fellows who will be willing to attend meetings. Admiral of the Fleet Sir Henry Jackson has also consented to give the council the benefit of his advice.

11. Whilst the above set forth the organization of scientific research for purely naval uses, it will be the constant endeavor of the Admiralty to work in close collaboration with the army and the air force for the joint prosecution of such researches as can profitably

be undertaken in this manner. It may, in this connection, be desirable to state that there already exists the ordnance committee for dealing with ordnance questions affecting the navy and army.

EXTRACTS FROM DEBATE IN THE HOUSE OF COMMONS ON BRITISH NAVAL ESTIMATES.

Source: Reliable.

(12855–A.)

17 March 1920.

The First Lord of the Admiralty (Mr. Long):

I desire to direct the attention of the house first of all to the personnel. The reductions there are very remarkable. Before giving the figures, I say quite frankly to the house that in presenting these reduced estimates it is an undoubted fact that we run some risk, if risk it may be called; but we believe, and the Government to which we belong believe, that we can not possibly be exposed to any real risk of a contest for our supremacy at sea, if ever, at all events for some time to come. Therefore, we are justified in asking the house to approve of the estimates which represent much less demands on the taxpayer than would be the case if we thought that we must face immediate dangers and provide against them. Let me give the house the figures. At the time of the armistice the strength of the navy was 407,317. In November, 1919, it was more than 257,000. The maximum for next year—that is, 1921—which we are entering upon, is 136,000, and at the end of next year 131,000. The fleet which we ask for in the future, the post-war fleet, is 127,500. In 1914–15, the year in which the war began, the numbers were 151,000, and in 1920–21 they will have fallen to a maximum of 136,000. I do not think that the most determined opponents of armaments can deny that the reductions we have made have been very great. It has been said that we have got too many of the men who were enlisted for hostilities only—that is, for the war. As a matter of fact, there are now only between 900 and 1,000 of them left, and of those 600 belong to the trawler reserve, and they are kept on waiting for the reconditioning of their trawlers.

The immense reduction in numbers involves, of course, a consequential reduction in officers, because it must be obvious to the house that this diminution in total strength involves a surplusage of officers for whom there will be no employment. I am very sorry that I am not in a position to-night to state precisely what the terms will be which we propose to offer to the officers that are retired. There are two or three details of the scheme which are not yet finally set-

tled with the treasury. We anticipate that they will be settled within a very few hours. I was quite hopeful that they would be settled in time to enable me to make the announcement to-night. We are doing our best to see that the terms offered to them shall be satisfactory terms and such as will enable them to turn their great ability and knowledge and experience into other channels and other professions and occupations in a way which will, I think, on the whole not be regarded as ungenerous even by the severest critics. Until they are approved no definite announcement can be made. There is the case also of the royal naval reserve and the royal naval volunteers. Here, again, we are not in a position to state precisely what the plans for the future will be. We feel that a great debt is due those great branches of the naval forces for the splendid services which they rendered throughout the war and before the war. We readily acknowledge that they will form an essential part of the naval forces of this country in the future, and we have every intention of availing ourselves again of their services. The precise details of the scheme depend very largely on the exact numbers, and until that question, with one or two others, is settled we can not announce what the arrangement will be. But the members of these great forces may rest assured that the Board of Admiralty is in no way unmindful of the debt which this country owes them, and we have every intention of doing our best to secure their invaluable services in the future.

So much for the personnel; I now come to the strength of the fleets for the future. In the statement which has been circulated I have given what the fleets are and what their complements in the future are to be. The Board of Admiralty and the Government were confronted with an extraordinary difficult task. Before the war various Governments had to consider what the strength of the possible enemies on the sea opposed to them might be, and, as the house knows, there were various standards taken, but I think it was generally accepted that our strength ought to be equivalent to that of the two next strongest powers, and in one sense—I am not pretending that there were not many difficulties—the task was even easier then than it was for the Board of Admiralty to-day, because, while it is, of course, essential that the navy of Great Britain must be maintained at a strength and a standard of efficiency sufficient to enable it to do its duty by the Empire, yet it is also true that, look where you will, you will find it difficult to-day to find a possible enemy. The Germans, who were the cause of this war, who brought so much suffering upon humanity, who were so proud of their navy, who built it at such immense expense to themselves and thereby entailed upon us very great expense, the Germans are to-day without a navy. A portion of it lies beneath the waters at Scapa Flow

and a portion of it has been distributed by the Allies in the different forces of those Allies. The Germans have disappeared. There is practically no naval power to-day which can offer to us any serious threat of opposition, or indeed any threat, because our principal enemy navies have been destroyed.

Looking around the world to find what is the navy which at this moment is the next in strength to our own, we find that the only one is the Navy of the United States of America. I believe it is a fact that the naval policies of all past Governments, whichever party they represented, have, at least, included this common principle, that our navy should not be inferior in strength to the navy of other powers, and to this principle the present Government firmly adheres. We are very fortunate in the fact that the only navy approximating in strength to our own is that of the United States of America, with whom we are associated in such a way that the idea of competition in armaments between us is one that is, to put it mildly, repugnant to us all; and we here—and I speak now, not merely for the Board of Admiralty, but for the Government—hope and believe that if there is to be any emulation between the United States of America and ourselves, it is likely to be in the direction of reducing that ample margin of naval strength which we alike possess over all other nations. That is the foundation of the naval policy of His Majesty's Government. This is not a matter for the Admiralty, this is a matter for the Government, and this is the policy which we have deliberately adopted, and I, at least, think it is a policy which will command itself to the House of Commons and the country.

We have sometimes been told that the old distribution of our fleets ought to be altered, but that is not the view of the naval advisers of the Board of Admiralty, and it is not the view of the Board of Admiralty itself. We still have, as our two main fleets, the Atlantic and Mediterranean, and I would only say to those quite friendly critics who have often suggested that the real strength should be concentrated in the Mediterranean but not in the Atlantic or home fleet that I do not think there is any real point of difference between us because it is perfectly easy, at any moment in a very short space of time, to work those two fleets together in such a way to make the one helpful to the other. I will instance the case which arose only the other day, when, as the house knows, we sent the first battle squadron of the Atlantic fleet, which was then at Malta, to strengthen the cruiser fleet in the Mediterranean at Constantinople, because the commander in chief in the Mediterranean wanted his forces strengthened. Therefore I think we are justified—at all events that is the considered view of the Board of Ad-

miralty—in retaining the old division. Then we have the various squadrons stationed all over the world. There has, I know, been discussion at one time and another over the policy of what is called showing the flag—that is, sending our squadrons of light cruisers into the waters of the world. Since I have been at the Admiralty I have had many opportunities of discussing with men at first hand their experiences in different parts of the world, and I am satisfied that anybody who approaches this question with an open mind, and who will take the opportunity of discussing it with men who have returned from different parts of the world, will come to the same conclusion as I have done—namely, that it is essential in the interests not of peace or war but of trade and commerce and progress and prosperity that our ships should show the flag in different parts of the world. I am also certain of this, that anybody who will take advantage of the experience of these people who come home from these different places will find that there are abundant cases where the appearance of an English cruiser in foreign waters has given an enormous impetus to the efforts and labors of those who are trying to push British trade in different parts of the world.

Therefore to that policy—the policy of our two main fleets and of our squadrons showing the flag—we confidently adhere, and we believe that the navy which we are asking for and which we are distributing in this way, is adequate for the work that it has to do. May I remind the house of this very pregnant fact? Previous first lords have had the great advantage of the services of distinguished sailors who have served the Empire in many parts of the world and in the Board of Admiralty, in different offices, with distinction and ability; but no first lord, for I do not know how many years—I am very bad at history—has stood in the position that I stand in to-day, and that is that every naval officer that I have, every naval lord, and not only the naval lords, but the junior officers who work under them in all sorts of capacities at the Admiralty—every one of them has come fresh from the sea full of the experience and knowledge gained in this great war and able to give us the benefit, not only of the ability and training which sailors acquire in peace time, but of the actual knowledge which they have acquired, either in holding high commands or in subordinate capacities during this war in various parts of the theater of war. It is an inestimable advantage, and I venture to say that it gives an extra authority to the recommendations which the Board of Admiralty make to the house to-day in regard to the constitution of the fleet and to its distribution.

We have been told in some quarters that the day of the big capital ship is over. All I can say is, that, in the first place, that is not the view of my naval advisers at the Board of Admiralty, and it is not

the view, so far as I can find out, of any other great naval country. There is no country which desires to have a strong navy which is not to-day actually laying down big ships, and the theory that the day of the big ship is over is one for which there is not really, if you examine the evidence, one shadow of foundation. In the statement which I have circulated I give some evidence drawn from the actual experiences of this war. It is true that the naval advisers of other countries are firmly convinced that the capital ship is as essential a part of any fighting navy as ever it was. That is undoubtedly the case, and my naval advisers are satisfied that the big ship, if you, unhappily, ever came to war, would prove again, as it has proved before, to be the predominant factor in naval warfare, and that in the end the weight of metal would tell, and that therefore the big ship must, at all events for some time to come, be preserved as an important part of our naval equipment. I know it is said in many quarters—and there are reasons to which I will not refer why I should not regret the fact—that the Admiralty and the navy are much too conservative, that they adhere too long to old theories and old doctrines. This is not a political debate, but if it were I should be inclined to say, when we talk about Conservatives being too crusted, too inclined to stick to old traditions, that it is a good thing to stick to old principles until really new principles are established which you can accept. I have no doubt my right honorable and gallant friend opposite [Maj. Gen. Seely], who was a distinguished member of the air force, and speaks with unrivaled experience in regard to the air force, will be inclined to say, "You are too blind to the development of the air force; you do not realize what the air force is going to do." I do not think that charge is well founded. We are not blind to what the air force may do. We are not blind to what the developments may be. All that we say at the Admiralty is that your developments have not come yet, and a great deal has got to be done before you can say with confidence "You can dispense with your big ships, because we can do all that is required."

You will find plenty of evidence in the war for what I am saying. All we say at the Admiralty is that, as we are advised to-day, we see no prospect of the time coming in the immediate future when we can afford to dispense with the big ships. May I say another word from another point of view? It is not only as a weapon of war, or, as we believe, at the Admiralty, the decisive factor in the war that the big ship is required, but if you are going to maintain the training and personnel of your navy at the high level at which it has been maintained hitherto, the big ship is absolutely essential. I do not know a sailor who does not hold—and hold with great vigor and great determination—with the view that you can not train your

officers and men thoroughly and effectively unless you have a certain number of big ships on which to make them serve for a period of time. Therefore, whether from the point of view of warfare, or from the point of view of training, it is in the opinion of the Board of Admiralty absolutely essential that the big ship should be maintained. That is our policy, and to that we intend to adhere until much stronger evidence is shown than has been produced up to the present.

I turn now to a question which has aroused a great deal of interest, quite naturally, the staff at the Board of the Admiralty. Of course, I have only been a very short time at the board, and the last thing I wish to do, or ever have done in my long political career, is to use any language which would seem to be critical, much less condemnatory, of any of my predecessors in the office which I happen to hold for the moment. But I think in the old days before the war the question of the staff at the Admiralty had not been thought out or dealt with in a sufficiently satisfactory manner. Then came the war and the urgent need for a staff, and, under the pressure of the war, a staff was devised on a much broader basis and of a much more efficient character than anything that had existed before. But it is obvious that work done under the pressure of war can not be so effectively done as when you are able to regard your problems under the easier conditions of peace. I believe that the staff as now established at the Board of Admiralty is thoroughly efficient, thoroughly competent for the very important work it has got to do. We have got the chief of the naval staff in the first sea lord. The predecessor of the present first sea lord, Lord Wester Wemyss, who was first sea lord and chief of the naval staff when I first went to the Admiralty, devoted most of his time to the working out of a thoroughly satisfactory and efficient staff system. He left behind him a great part of the work completed. The present first sea lord took it up the moment he arrived, and I think we have now got a staff in, as I have said, real businesslike working order.

I will not trouble the house with a long description of it. We have got the chief of the naval staff, the deputy chief of the naval staff, who has charge of operations and other duties, and then have got the assistant chief of the naval staff, and I want to say a word about that, because it is this case that the most important change, in my judgment, has been effected. The assistant chief of the naval staff in future will be charged with the duty of advising the Board of Admiralty, through the chief of the naval staff, as to what are the best types of guns, projectiles, and weapons. Hitherto that has been the duty of the controller of the navy. He had two tasks of a totally different character to perform. It was his duty

to advise as to types of guns, etc., and at the same time to advise as the best method of purchase and construction. Those duties will in future be divided. While the assistant chief of the naval staff will be charged with the duty of advising what is the best type, it will be the duty of the controller to devote the whole of his attention to the best and cheapest way of procuring what is wanted by the navy as a whole, and I believe this division of duties will prove to be probably the most businesslike change that has been made for some time. It is due entirely to the present first sea lord, of whom I would only say that I ventured to predict what his career at the Admiralty would be when I spoke last on the navy estimates, and I will only say this, that he has already gone far to establish as great a reputation as an administrator as he had already acquired as a great naval commander. The duties of the staff, of course, become more arduous and heavier as the developments of science progress. It is their duty to advise us as to what is not only the best kinds of submarine, torpedo, etc., but it is also part of their duty to superintend those experiments which are essential if we are to keep abreast of the times.

As the house knows—this is also referred to in the statement—we have at Shandon an establishment where experiments are conducted in various directions and with various objects, notably—this is the most interesting and probably the most important of them—experiments which are connected with helping to hear what hitherto we have been entirely dependent upon our eyes for seeing. Wonderful developments are taking place, but Shandon is not satisfactory. It is too far away, wrongly situated, and too expensive. We hope by the end of the year to be able to give up Shandon altogether and to build an establishment at Teddington which will be close to the great laboratory there, and which will, therefore, be in touch with it and enable us to do the scientific experimental work much cheaper than and with equal efficiency to that we are now doing at Shandon. I think I can say from my own personal knowledge and observation that the staff at the Admiralty are engaged in daily and hourly examination of the scientific and other problems with which we are confronted, and that we have now got a staff which will enable us to keep our navy thoroughly abreast of the times. It would be wholly unjustifiable if I said that our proposals, while they are economical, have not also been framed for efficiency, and my language would have been wholly unjustifiable if I had not been able to tell the house that the staff are thoroughly engaged in watching every development and in examining for themselves all the possibilities in order that our navy may be kept, in the most literal sense of the word, abreast of the times.

Let me turn for the moment to our relations with the air force, I know the right honorable gentleman opposite [Maj. Gen. Seely] thinks we are too conservative. During the time he, with so much distinction and advantage, held the position of the representative of the air ministry in this house, he more than once paid a very generous and I think I may add well deserved tribute to the Board of Admiralty for their efforts to see eye to eye with him in their joint working. I can assure him and all those like the honorable and gallant gentleman opposite [Capt. Benn], who are profoundly interested in the air force and convinced believers—largely from their own practical experience at the seat of war, where they did great and gallant service—profoundly convinced that in the air force is to be found salvation for the future: that if we are not prepared immediately to accept as prudent all they advocate and suggest, it is not because we are too conservative, but because, as I said just now, we are entitled, as trustees for the navy and the security of the country which the navy means, to ask that we shall get further and more powerful development before we take the view they ask us to take, of what to a certain extent is still a thing of the future. I want to make it perfectly clear, for there has been some misunderstanding, that there is no intention whatever on the part of the Admiralty to attempt to depart from the clear and definite policy laid down by the Government, of which I had the honor to be a member, namely, that the air ministry is to be an independent department, and that we should look to them for developments of air policy in the future, for the best kind of air machine, the way in which the men have to be trained, and so on.

Some advocates of the air go further, and suggest that the Admiralty has not accepted the clear conditions laid down and arranged with the air ministry. They go further and suggest that where the two forces are combined the air commander is to be commander of the naval forces. So far as that is concerned, the Board of Admiralty will offer the most strenuous opposition. They maintain that responsibility and command must go together. They are responsible for the navy. The navy is the great security for the safety of the country, and they can not share that responsibility with anyone. This is a matter which will have to be discussed between us later. It is, I think, at present in its infancy. I think, however, it is my duty to state quite plainly as to this matter, that there is no difference of opinion in naval circles or with those civilians who, like myself, are associated with the Board of Admiralty. There is one other question which bears upon this. It has been suggested that if the time has not come, it, at all events, has very nearly arrived when one minister could represent the three forces—a minister of defense.

Speaking for the Board of Admiralty, any proposal of that kind will be most strenuously resisted. I do not know a sailor who can be found who does not believe that that would be most detrimental to the real security of the Empire. Consistently with these two views which I have sought briefly to express, we are not desirous in any way of interfering with the duties, responsibilities, or rights of the air ministry. All we ask is that we shall be consulted as to what we want, and allowed to state what we want, in order to pursue our work properly, and not be interfered with in matters in which in our judgment, freedom of action can not be separated from responsibility.

We are making, as the house knows, a certain change in regard to the training of our naval officers. The Board of Admiralty profoundly regrets that the time has come that we have to put an end to Osborne. As the house knows, Osborne was given by the late Sovereign to the Admiralty as a great training college. We are desirous that reasonable economy should be effected. We feel that the time has come when Osborne and Dartmouth ought to be and shall be amalgamated, and that in future cadets entering the Navy shall go to Dartmouth instead of Osborne. We propose that Osborne should be given up in 1921; that the age of entry for cadets should be as it is now, 13½ to 14; that the special entry shall be maintained, the age for which is 17½ to 18½—this for a small number of those who enter. It is believed that the approximate annual number will be somewhere about 120 cadets, and about 15 special entrants. This involves some arrangements to be made for those cadets who are now at Osborne.

Lieut. Commander Kenworthy.—I think it would be very convenient—it is, I admit, a small point, but it is very important—if we could be told whether, when a parent voluntarily removes his boy, that boy will be allowed to set for examination later on.

Mr. Long.—That, I think, is a point well worth consideration, and I will consider it. Of course, my honorable and gallant friend must know that all depends on the number of vacancies there are. We could not give special advantages to any boy who had been removed as against boys who come up from Dartmouth. But I shall be very glad to consider the point. That is all I have to say about Osborne and Dartmouth. I hope that honorable members of this house who may be approached by their constituents or by friends as to what will really be the future of the boy at Osborne and Dartmouth will not forget that the boy staying until the completion of his term is really getting a very great advantage. These boys are, in fact, receiving a first-class education and a fine manly English training on very moderate terms. This, of course, does not deal with a question

which has raised a great deal of interest, and which is of vital importance—namely, the means of entry into the navy. It has been said to me in this house, and it is constantly said outside, and very naturally and very properly so, that the advantages which you are giving to these boys should be also given to boys coming from the elementary schools, whose parents are just as strong supporters of the navy and of the Empire as we are. They ask, Can you tell us if these boys are to get as good a chance of passing into the navy as the boys from Dartmouth? It is impossible and, indeed, it is useless to pretend that two boys side by side, one educated in an ordinary elementary school and the other in one or other of these preparatory schools, where special care is taken to prepare boys for naval service—it is impossible to pretend that two such boys are on an equal footing, and you have to find some means of equalizing these disparities if you can. We have not found them yet, but they may be found in some other form of education, and we are working at that, because we are anxious to give effect to what my predecessor and I have more than once said, that if possible we must make it easy or, at all events, as easy as one can, for boys with lesser educational advantages to get into the navy.

We have at all events made one great stride in this direction, and that is in dealing with the mate question. The mate question was the system by which it was made possible for a petty officer with good conduct to become an officer and to pass up to the quarter deck. We found that, owing to the age at which these men were promoted, they came to a period in their service when future advancement was denied them; that is to say, a man becoming a lieutenant at the earliest at 28, found as he passed through the various grades of the service that he was shut out from the higher commands—from flag rank. What we have done is that we have devised a system whereby men selected by the selection board at 21, provided they be of first-class character and able to pass a certain examination, may, after undergoing a special training, become lieutenants at 23. That does not sound very much, but it is a tremendous stride in the direction of opening the quarter deck to those who, by circumstances, are forced to enter the navy through the lower deck. It is a real alteration, and it will be true in future, as far as these men are concerned, that all ranks in the profession will be open to them, and that a man can go to sea with the certainty that, if he be competent, he may rise to flag rank, which, under existing conditions, is impossible.

Further, with regard to the training of officers, we propose that in the future the cadets shall devote more than their time at Dartmouth to general education. They will spend 3 years and 8 months at Dartmouth and 8 months on a training ship. Then they will go to sea as midshipmen, and they will be educated afloat under spe-

cially selected instructor officers. After 2½ years at sea they will become sublieutenants; then they will go through a Greenwich College course, passing in tactical subjects and an elementary war course, and subsequently we propose, if we can secure the consent of the University of Cambridge, that one-quarter of them shall go through a special course at Cambridge. We believe that that will give a wider outlook to the naval cadet of the future, and we are hoping—indeed, my naval advisers are confident—that with these means the education and training of the future will be of a more general character, and that the cadet of the future will be given a better chance than he has hitherto had. That is the view which is held by those who themselves have gone through the course. I am only a civilian. I never was educated anywhere. I spent five very happy years at Harrow, but I failed to become educated. That, however, was my fault and not Harrow's fault. Therefore, I am speaking not from my own experience, but from the experience of naval officers who agree that this system will give a better chance to the cadet in the future. Time only will show whether we are right or wrong. At all events, this view is based on close examination of the subject and on experience of men who have been through it themselves, and they believe it will prove a substantial advance in our naval educational system. As regards the training of officers for the higher command, commanders and ranks below, to the number of 40 a year, will take a staff course at Greenwich qualifying them for work on the war staff at the Admiralty and afloat. We indicate that a change must be made in regard to the position of the engineer officer and the cadet officer.

I believe there are some who hold that we are taking the wrong course altogether and are destroying a system which has worked well. This system, which was established 16 years ago, has gone through several modifications, and we are proposing it now because the experience of every officer with whom I have discussed it, whatever his rank, is that this change is essential if we are to have for the future the engineer officer we need and must have, but early education, early training, and common entry are all retained, which is, in my judgment and in that of the Board of Admiralty, the vital part of the scheme. We are told that it is an actual fact that under the scheme as it now exists you can get the necessary number of engineer officers. They must be got. It is not because we want to do something fresh ourselves; it is not because we want to strike out a new departure and get credit for this or that. We are doing it because we believe it to be essential to the efficiency of the navy in the future.

I should like to say a word about the great cruise which Lord Jellicoe made. In some quarters it has been stated that we ought long ago to have expressed our views as to what we mean to do in

respect of his reports. If honorable members saw those reports I do not think they would criticize them. They are very long, they require very careful examination, and they involve very great considerations. I am entitled to speak on this with some authority other than that possessed even by naval officers. I had two most interesting years in my official career when I served as secretary of state for the colonies, and during those two years I had an experience, which no other secretary of state has ever enjoyed, of presiding in two consecutive years over great imperial war conferences when the prime ministers of our Dominions, the ministers of marine, the ministers of defense, finance ministers, and others were here, and I not only heard those questions discussed at the conferences, but I had the immense advantage of discussing them privately with those ministers on many occasions.

Whatever may be the view of His Majesty's Government as to our policy for the future in connection with the Dominions, you will do nothing in the way of working out a real scheme until you are able to meet here in London, discuss this round a table, and talk it over with the representatives of the great Dominions—and then, possibly, you will arrive at some businesslike conclusion. To produce some hasty scheme, simply because we are told we ought to have action in respect of these reports, would be a criminal action, not only by this country but by the Dominions. It must not be thought we have been idle. We have been in communication with the Dominions on many subjects. We have made one or two steps, small, but important. I hope on our naval staff we shall have the advantage of representatives of the views of the Dominions, who will work with us in connection with great naval questions. We are a slow people in Great Britain. We come rather slowly to realize even the most patent facts. I speak on this subject with real knowledge and experience. You must go slowly in all these future developments of our great Dominions. They have accepted immense responsibility, they have made heroic sacrifices, they are bearing great burdens, and they will not be hurried into doing anything which may be calculated to interfere with their absolute right of controlling their own affairs. We must approach this subject slowly and cautiously, and I am satisfied that the best solution of this great question of a combination of all the Empire in one great naval provision will be found most safely and most satisfactorily by the sort of conference I have indicated, rather than by hasty discussions or debate or announcements by the Board of Admiralty. It is impossible to exaggerate the debt we owe to Lord Jellicoe. He bestowed immense labor on the work. He has displayed the greatest tact and immense ability. I hope neither he nor any one else will think this labor has been in vain.

I should like now to say a word about the welfare committee. It was set up in the early part of last year. Its object is to provide the machinery by which the lower deck can express their views and can, if they have them, give utterance to their objections to certain existing conditions and can come into closer touch with the Board of Admiralty than was possible before the welfare committee was established. It has just concluded its sittings. It was presided over by Admiral Jerram, and a great debt is due to him for the great services he has rendered to the navy and the country by presiding over it, and also by the work he did in connection with the pay of the navy. It has produced a series of very long reports dealing with an immense number of subjects. It is impossible for us to give a decision upon it in a hurry. It would be very wrong, but I can see from my little experience of the navy something more than the germ of a great future for the service. I am satisfied that if the committee is sympathetically treated, as I know it will be, by the Board of Admiralty, if under a wise and sensible president free opportunity is given to the representatives of the lower deck to state their case, to put their views, to express their objections to the existing system, there will grow up a conviction in the minds of the lower deck that they have in the welfare committee a real opportunity of getting into close touch and taking an active part, and I am sure it will always be a loyal and honorable part, in deciding questions which so vitally affect their own lives and their own future and those of the sailors who will come after them. Therefore, I attach enormous importance to the committee, and no Board of Admiralty will ever fail to give it every possible opportunity or to give to its recommendations the most sympathetic and most careful consideration.

I come now to the dockyards. Again we have been very much criticized. We have been told we have been very slow in acting upon the report of the Colwyn committee and, of course, the good old gag has been trotted out—whenever critics of any Government of whatever party have nothing else to fall back upon they always talk about red tape. It seems to me that the talk about red tape will have to be dropped, because for some reason or other connected with the war we have been using not red tape but white tape. We are told "You are doing nothing at the Admiralty about the Colwyn report. It is all red tape." Many people are attacking the Government about wild extravagance. The papers are full of it. Honorable members in this house are constantly saying that the Government is extravagant and wasting public money. What am I to say to my critics in connection with the Colwyn report? What did the Colwyn committee do? The reference to that committee was to inquire into two questions, one the leasing and sale of our dockyards

for the building of merchant ships. They reported against leasing, but reported in favor of building commercial ships in the dockyards. Then our critics say, "You have the Colwyn report. Why have you not done something?" I would remind these critics that, although the Colwyn committee tells us that we ought to build commercial ships, they did not go into the difficult operation as to how the work was to be done by the Admiralty. It is one thing to tell the Admiralty to build commercial ships, but it is another thing to find out how that work is to be done satisfactorily by the Board the Admiralty who have never done such work in the whole of their official career. We had no machinery for building commercial ships. The committee deliberately stopped at the general recommendation. As soon as we received the report of the Colwyn committee I appointed another committee composed of experts to advise the Board of Admiralty as to the best way to set up machinery for the building of these ships. I tell my critics quite frankly that, whatever they may wish or whatever they may choose to say, I had no intention, if I could prevent it, of allowing the Board of Admiralty to be hustled into a position in which we should after 6 months or 12 months have been open to the charge that we have wasted thousands of pounds of public money because we had started to build ships when we had no adequate machinery. Therefore, I appointed this expert committee.

What is the position at the present time? One might think that the question of building commercial ships is very simple. It is extremely complex. I will read a few extracts from a statement I drew up from information given me by the experts, because I do not pretend to understand this subject. It comes to this, that you can only increase the number of ships which you purpose to build to the extent to which you have men of each of the various trades concerned in the building of ships. There are a great number of trades concerned, quite distinct one from the other. You may have 10,000 surplus men in your dockyards, but among those 10,000 men there may not be one man whom you want for some of the trades you will have to employ for the building of commercial ships. In the dockyards these various trades, in consequence of the war, got into a state of serious disproportion. We have to-day not nearly enough shipwrights to balance the numbers in the engineering and electrical trades. This is not peculiar to the Admiralty. I am informed that the same thing applies in the private shipbuilding yards. The same difficulty exists there of this disproportion of the various trades. You can not build a ship, I am informed, unless you have a sufficient number of the different trades concerned in shipbuilding to balance one trade with the other. That this is so is borne out by this fact. We have been asked to build the hulls of commercial

vessels while the commercial firms have offered to build the engines. We said: "We will build the machinery if you will build the hull," but we have not had one single response to our request.

We are laying down two oil tankers. I am not prepared to undertake on behalf of the Admiralty to speculate in wider fields than oil tankers. We are laying down one oil tanker at Devonport, and one at Pembroke, and we hope we may be able to lay down another at Portsmouth later in the year, but as to this I make no promise. I must be entirely dependent upon the progress of repair work on ships of the royal navy. If we are to go far into this class of work, it can only be done by taking shipwrights from naval work and diverting them from work which may be absolutely essential. We are not prepared to run a risk of that kind. If we can, consistently with our duty to the navy, we shall lay down a third ship later in the year. Any further opportunities of taking in hand work such as is contemplated in the committee's report will be watched for and utilized. We may be able to retain a limited number of men on the work of overhauling the dockyard cranes. This only means a very small number of men. The number of men in the dockyards to-day is much greater than in prewar days, while the work is obviously less. This policy of building oil tankers is only a policy intended to avert an unexpected and undeserved trouble which had nothing to do with us. It was due entirely to the fact that you can not move men back to the place from whence they came because of the housing conditions. If it was not for the difficulty of housing these men could move freely to the yards from whence they came. It is no good, and I say so most respectfully, to urge the Government on a Tuesday to be economical and to save money and to cut down expenditure in all directions, and on the Wednesday to tell the Admiralty that they must spend money which they do not want to spend on work which they do not want to do in order that a certain number of men can be kept in employment.

18 March 1920.

Maj. Gen. Seely.—I beg to move "That the number to be employed be reduced by 100."

I desire to call the attention of the committee to one very important aspect of these estimates. On the general question, my right honorable friend the member for South Molton [Mr. G. Lambert] is far better qualified to speak than I am, in view of his long experience at the Admiralty, but this is a matter of general and, indeed, of vital importance. In his statement, a lucid statement, to which tribute has been paid by speakers on all sides of the House, the first lord of the Admiralty referred in one phrase only to the

possibility of there being one minister responsible for defense, and he said with emphasis that it was a proposal which the Board of Admiralty would resist by every means in their power. That is a definite declaration of policy which I hope does not mean that the right honorable gentleman and the Board of Admiralty are going to oppose what seems to be the most urgent necessity in the matter of defense, namely some form of coordination between the three services. I said the other day that the lack of coordination had already cost us millions of money. I am sure that is so, and some way must be found, as it was found before the war, to insure that there is coordination. If the proposal were to extend the present system, to which exception has been taken in many quarters of the House, and under which the secretary of state for war is also secretary of state for another department, and the first lord of the Admiralty also, I agree with the right honorable gentleman that it would be a ridiculous plan. The navy would never stand it, and the country would never stand it. When the right honorable gentleman says that he will oppose it, I hope that it does not mean that he will oppose some system such as that which prevailed before the war, and which shall secure, when it is a question how we are going to prevent the massacre of Armenians, how we are going to cope with a possible menace of a much greater character, or how we are going to defeat the Mad Mullah, that all three services shall be forced to consult together and not work in water-tight compartments, as I regret to say they have tended to do since the war.

Before this war the need for this coordination was found. The committee of imperial defense, of which I was a member for many years—I suppose, technically, that I am still a member—of necessity worked in secret, but it did work of a most valuable kind. We are often told that we were unprepared for war. I think the German phrase that we were a nation who, while talking peace, prepared for war and were more ready, within the limits which we imposed upon ourselves, than any other nation is more near to the truth. It is the fact that under the guidance of my right honorable friend the member for Paisley [Mr. Asquith] assisted, of course, by the present prime minister, and, in one most important matter, by the right honorable gentleman, the lord president of the council [Mr. Balfour], we did make plans for a possible outbreak of war which worked better, and I say this without fear of contradiction, than the plans of any other power that was engaged in the late war. Within the limits which we imposed upon ourselves, we were more successful certainly than Germany or any other of our enemies, and I think than any other country that took part in the war. In all our wide-flung Empire no single hostile foot was put upon British soil,

except for a few poor, half-drowned Turks who swam the canal. The command of the sea was obtained and maintained and insured but for the submarine menace which was combated only later in the war, and the forces which we designed to take part in European warfare arrived at the critical moment, with the help of the Navy, where they were required with greater certainty and with greater effect upon the issue of the war than the corresponding forces of any other power. It may be said that different plans ought to have been made, or that we ought to have made them on much bigger scale—that is another question—but within the limits which we imposed upon ourselves we were better prepared than any other power. Why? I say it was because the committee of imperial defense had been patiently working for years trying to think out the different problems, naval and military, and, as it turned out, thinking them out not entirely without success.

The air having come into picture, the problem is much more complicated, and yet there is no coordinating body now in existence. The committee of imperial defense has not been set up and is not functioning. The prime minister, the only coordinating authority, can not possibly have time to do it, seeing that he is our representative on the Supreme Council and must of necessity often be absent even from this country and, of course, constantly absent from any such deliberations as those of the committee of imperial defense. I believe that our proper course, and I press the right honorable gentleman, if I may, to say that the Board of Admiralty would not oppose such a course, would be to revive the committee of imperial defense in a better form, giving it wider powers, with a vice president who would be responsible for seeing that the different views of land, sea, and air were properly accommodated before any action was taken. The failure to do this has been very expensive to us. I said the other day that the neglect of the air arm in its application to the navy was scandalous, and I regret to say that I can only repeat that word. It is scandalous, and I say that, although I know perfectly well that the right honorable gentleman himself holds the strongest views, for he has expressed them, as to the necessity of keeping an open mind and very widely open eyes as to the future possibilities of the air. Indeed, in this memorandum which he has issued, the best and clearest memorandum issued with the navy estimates that I have ever read, there is much with regard to cooperation between the sea and the air with which we must all agree. The statements are admirable; it is the practice that has been at fault.

I will just give two instances and only two. Take the first. The dropping of torpedoes from the air is a most difficult business.

There is no secrecy in the matter, because this has been referred to openly, both in this house and outside. It was only a short time ago that the problem was solved. It is now quite easy to drop a torpedo from the air with as great accuracy as you can discharge it from a ship. No man can foresee what the effect of that must be upon our naval future, but that the change is enormous and vital must be apparent to all. I agree with the right honorable gentleman, although it is not a matter of which I can speak with any expert knowledge, that it does not follow that the capital ship is doomed. That would be a ridiculous thing to say. It certainly is not doomed now, because the things are not there. We can say, however, that it has profoundly modified not only tactics, but even strategy, and from all that I have been able to learn, and this also is a matter of common knowledge, the air ministry have practically ceased to experiment in this most vitally important question in all departments of our naval, military, and air activities, owing, I believe, to the lack of some such body as the committee of imperial defense, over which my right honorable friend, the member for Paisley, presided. Owing to the lack of some such body, each department, in response to urgent appeals for economy, has pursued the most uneconomical course. They have stopped practically all fresh development—this applies less perhaps to the navy than it does to the other two services—and have continued to spend money on all the old-fashioned things. Except for the right honorable gentleman, who, although he was at Harrow, told us that he was uneducated—and yet has shown more signs of education than any of his colleagues, one of them being two-headed—they have sold themselves, on questions of national defense, to the reactionaries. Would it be believed that this most vital invention profoundly altering all our strategy, has not been pursued with any vigor; and that, indeed, the experiments were recently completely stopped?

The other instance brings us near home—not nearer in the sense of these shores—but near home to our thoughts and minds. It has been truly said that the effect of air power joined to sea power is to increase the range of your guns from 20 miles to 300 miles. In the course of our recent troubles with the Turk, troubles which are still continuing, we could without doubt have made short work of any trouble with Mustapha Kemil, whom we now know, from the speech of the foreign secretary in the House of Lords, to have been the source of all the trouble and probably responsible for most of the massacres. We could have made short work with him, as we did with the Mad Mullah, had the navy been equipped by the air ministry with the appropriate number of aeroplane-carrying ships, seaplane-carrying ships, seaplane carriers, and all the necessary para-

phernalia for insuring that our sea power had the long arm of the air ready to help them. If my information be correct—I dare say that the first lord of the Admiralty will tell us, if the matter be not confidential—the provision of aircraft with the fleet at Constantinople was so lacking that it would not have alarmed the most pusillanimous Turk. That vital part of our power was taken from us by the lack of the necessary provision.

I have attempted to deal only with a single point, and I hope the committee will see that now, as in the past, I have tried not to speak at any great length. If I have spoken briefly, I hope the first lord of the Admiralty and the commitee will agree that I have attempted to deal with a matter which is one of vital and transcendent importance. To make this definite, I formally move a reduction of 100 men in the vote. I make this definite charge against the Government as a whole, not especially against the first lord, who has shown far more alertness in the matter than others—that there has not been proper coordination between the services; that so far they have been built in water-tight compartments; that they have not seen to it that a policy has been pursued with vigor to enable us to obtain the advantage of the new inventions that we saw in the war.

I say that, so far as the fleet is concerned, in proportion to the money spent, it will be less powerful than it would have been if it had been assured of the cooperation of the air force. It is vitally necessary to secure some means of cooperation. While it would be foolish, as some have proposed, to have one minister to preside over the Board of Admiralty, the air council, and the army council—no member of this house would approve of that, I think—we do believe that somebody, such as the committee of imperial defense, with adequate powers should be set up forthwith to see that there is no further waste of money or effort on account of a lack of proper coordination.

The First Lord of the Admiralty (*Mr. Long*).—I rise mainly to deal with the important question raised by the right honorable and gallant gentleman who has just spoken. He has referred to the committee of imperial defense. The appointment of that committee and its constitution is the privilege of the prime minister of the day. After consultation with the other members of the cabinet, no doubt, he would have to decide, in conjunction with the heads of service departments, what should be its membership and what its duties should be. My own opinion, which I give now, as I have given it before, would be that no alterations should be made in that committee in the direction of increasing the number of its members. I would rather see the numbers reduced than increased. Whether it is desirable to give it more power I do not know. In order to remove any misunderstanding which may have arisen from the language

which I used last night in regard to a minister of defense, I should explain that I was referring solely to the proposal which the right honorable and gallant member knows has been made in many quarters, that there should be one minister of cabinet rank, who should represent the three fighting departments, having under him the first lord of the Admiralty and the other heads. That proposal, I said, would meet from the whole navy the most strenuous opposition, not from any feeling of loss of dignity or jealousy, but because the whole machinery and control of the navy, the air force, and the land forces are so totally different that we do not believe it will be possible to place them in the hands of one man who should be responsible for the three. We do not think that it is possible for one man to accept the responsibility for the control of the three forces. I am confident—and the right honorable and gallant gentleman has had his own experience and I think he will agree—that unless you have a radical change in the constitution of the Government, more radical than any I have heard suggested up to the present, and you set up two or three cabinets or something of that kind, you can never approach the three ministers who are responsible for these forces and ask them to subordinate themselves to one minister of cabinet rank. I am afraid that would be to offer an insult to the heads of these great historical departments. That is the effect of what I said last night.

As regards the suggestions that have been made to-day, I do not propose to go into the question of our relations with the air force. We have been partially exempted from the criticism which has been made to-day on the other departments, but, although we have been partially exempted from that criticism, it is suggested that we might do more to encourage continuous cooperation and the examination of all the conditions. We have tried at the Admiralty, as I explained last night, to arrive at the policy which I announced. It has involved very heavy labor upon the Board of Admiralty and upon the various officers of the Admiralty, and I really think my language last night was hardly strong enough. No one can properly realize the task which fell upon the navy and, indeed, all the other departments who were left at the end of the war, in our case, to construct a navy which would be adequate to our future needs, and yet would not place a financial strain on the country, or a bigger burden than was absolutely necessary. Something has been said with regard to the air ministry and war inventions. We have really been trying, as I believe the other departments have been, to put our own house in order, and to prepare a proper policy for peace time. As to the committee for imperial defense, as I have said that is a matter for the prime minister to decide, and we should no doubt be consulted if it were being set up again. I think the suggestion that it

should be set up is one of the greatest value. I do not know what the prime minister will say about it. It is quite true that there are times just now when it is quite impossible that he could be available to attend, but obviously it would be very useful. We, at the Admiralty, are anxious to have this committee set up with as much rapidity as possible. We have made our view clearly known.

We are extremely anxious, also, that apart from or in addition to the committee of imperial defense, which is a body of ministers and experts, there should be a definite arrangement under which the staffs of the great fighting departments should meet regularly for consultation and to work out as far as possible a common policy. To that view I have myself expressed my personal adherence. It is most desirable. I can assure the right honorable and gallant gentleman that there has been no avoidable delay. We have been constantly inquiring how such a staff could be brought together. We have a staff, a small one, taking measures to secure the presence of officers of the Dominion navies, in an endeavor to bring about unity of action between the different parts of the Empire. The right honorable and gallant gentleman went beyond that and suggested a joint staff to represent all the fighting departments, so that a policy should be available which would be a joint policy and one of coordination. To that I do not think I should offer any objections. I have only risen to make clear the language which I used last night and how it is intended to reply to this wider problem.

JAPANESE NAVAL ESTIMATES FOR 1920–21.

Source: Summary of Budget Submitted to the Diet Dissolved 26 February 1920.

18 March 1920.

(12480)

	Japan proper.	Chosen.	Formosa.	Manchuria.	Total.
Navy department	$603,324	0	0	0	$603,324
Naval service	120,630,160	$1,025,943	$1,569,338	$923,736	124,149,177
Sundry expenses	24,841	0	0	0	24,841
Total	121,258,325	1,025,943	1,569,338	923,736	124,777,342
First period equipment of Chinkai port		305,484	0	0	305,484
Maintaining naval preparation	185,667,466	0	0	0	185,667,466
Shore works	45,182,677	0	956,213	110,000	46,248,890
Vessels commissioned	3,468,346	0	0	0	3,469,346
Munitions	12,932,151	0	30,468	0	12,962,619
Special accounts	2,900,000	0	0	0	2,900,000
Repair, upkeep of nonindustrial buildings	164,620	0	1,735	34,205	200,560
Repairs to private ships	673,756	0	0	0	673,756
Expenses civil engineering department pro tempore	27,116	44,343	0	0	71,459
Charts and books for sale	108,450	0	0	0	108,450
Extraordinary replenishing of arms	370,320	0	0	0	370,320
Pensions	15,584	0	0	0	15,584
Gratuity	100	0	0	0	100
Total extraordinary expenditures	251,510,586	349,827	988,416	144,205	252,993,034

THE GERMAN NAVY.

Source: Reliable.

(12966.)

18 March 1920.

In the transformation of the German Navy new names have arisen. The navy is now called the reichsmarine. The kustenwehr (coast defense) has replaced both the prewar seebataillonen and the matrosen artillerie.

The force of the kustenwehr comprises 1,800 men at Wilhelmshafen, 400 at Cuxhaven, 480 at Lehe, 2,000 at Kiel, the total being about 4,000.

While in port the navy personnel receives 6 marks per day; in garrison or on board and at sea, 2 marks extra.

The crews of the mine sweepers receive special allowances; besides the ordinary pay, they get a premium of 3 marks per hour's sweeping and a premium, which varies among the ships, according to the number of mines destroyed.

Very intense and active propaganda is made for the enlistment in the reichsmarine. One can get enlisted at the personalamt of the naval station of the Baltic, at Kiel.

The personalamt makes an appeal to young men of from 17 to 20 years. Besides the legal identity papers, they must produce a " curriculum vitae " worded by themselves.

The (definite) enlistment for 12 years only becomes definite after the recruits have successfully finished their military training, first on shore, afterwards on board.

Besides the reichsmarine there is another corps called the Wasserschutz (water protection), which is to the reichsmarine what the sicherheitswehr (security army) is to the army of the reich.

Formerly the reichswasserschutz (state water protection) was controlled by the chief of the admiralty, but since the 1st of last October, it is dependent upon the ministry for home affairs.

The avowed object of the reichswasserschutz is the protection of the waterways, the protection of food transports by water, the repression of fraud, of the illicit import and the transport of arms, and, in case of inland disturbances, it reinforces the land forces.

Up to the 1st of last January, the men belonging to the wasserschutz have retained the uniform and drawn the pay of the navy. At present, they are considered as employees, and a state commission has decided to grant them allowances both in money and in kind, which will correspond to the average salary of a laborer.

One can thus see the transformation of the German Navy, and one wonders what the luxury of the protecting of waterways must mean, who are the smugglers, the pirates, and the contrabandists that make it necessary to take those extraordinary measures of protection.

The complete revision of the staffs of officers ordered by the minister for the navy must take place shortly.

The forced democratic system will enable the noncommissioned officers who have proved to be capable to rise to the rank of deck officers.

The system of the soviets is still in force in the navy and prevails on board of each ship; its council comprises several men, each of them being elected for one year in each specialty—noncommissioned officers, sailors, stokers, etc.

No punishment inflicted by the commanding officer is valid if it has not been ratified by a member of the council, who passes on the proportionality of the punishment to the offense.

However, order and discipline still prevail under that apparent democracy; like in the army, the military spirit is prevailing more than ever before and the military salute, which was abolished in November, 1918, has again become compulsory since the 1st of last January.

NAVAL AND MILITARY INTELLIGENCE STUDY OF FOREIGN LANGUAGES.

Source: London Times, 24 March 1920.

Normal arrangements, the Admiralty state, are now being resumed under which officers may be allowed to proceed abroad to study languages with a view to qualifying as interpreters, subject to their having passed the necessary preliminary examination. Officers may also study languages in their own time without going abroad, and if they qualify will be eligible for the usual gratuities, but the sanction of the Admiralty must be obtained before beginning studies as the number of gratuities payable is limited. A knowledge of a foreign language or languages will be regarded as a recommendation when the selection of officers to qualify for war staff duties is made.

In order to enable officers not resident or serving in the Far East to obtain a preliminary knowledge of Japanese, a limited number will be selected for a six months' course of instruction at the School of Oriental Studies in London. While undergoing this course, officers will be borne on the books of the president for full pay. Those who, on completing this course, are recommended as fit to be sent to Japan will be placed on the roster for further study in Japan on full pay. These officers must be prepared to be appointed to ships on the China station while waiting for a vacancy to occur in the established number of officers allowed to proceed to Japan at one time. In selecting officers for study in Japan, special consideration will be given to those who have reached the necessary standard of

preliminary knowledge by their own efforts, whether on the China station or elsewhere. A certain number of officers are at present undergoing a preliminary course at the School of Oriental Studies, and toward the end of the present year applications to attend a second course will be considered.

VISIT OF NEW ZEALAND CABINET AND PARLIAMENT ON STEAMSHIP "MOKOIA."

Source: Reliable.

20 March 1920.

This visit resulted from requests made by the governor at Apia and later by the American consul general at Auckland, in both cases polite invitations being wired in reply.

The official party, besides the members and speakers of both houses, included Sir. James Allen, minister for defense (but acting as minister for external affairs), together with the ministers for justice and education. There were also six Government experts and three journalists attached to the official party.

After the salute, and during the exhibition drill, the cabinet officers and several others were admitted to the formal opening of the annual copra bids which happened to fall due at that hour. They saw the formalities, the sealed bids, and the award to the highest bidder, followed by the governor's address to the principal chiefs; the bid accepted, namely, 7 cents per pound, being the highest ever offered. It was thoroughly realized by all the New Zealanders that our methods are greatly superior to the haphazard policy in British Samoa and other islands.

The American naval methods of screening all buildings, and of providing electric light and abundant water were noted as being far in advance of anything in Apia or other British Islands, where hygiene is at a low ebb. The *Mokoia*, a 10,000-ton ship, was given 300 tons of water in three hours (without charge). In Apia it would take one week to supply that amount. The rigid quarantine rules here, which have kept influenza away, were admired and have been adopted as far as possible in the absence of naval supervision.

The party was officially entertained with soft drinks, etc., at the island government drug store during the walk around; later at a dance and formal luncheon, 125 being seated, at the governor's. After luncheon native dancers were shown on the parade ground and tea was served at the officers' bungalows at 5.15. The party left at 6.30, and, after entertaining 14 at dinner on board, sailed at 10.

Prohibition was discussed and will be established at Apia, although opposed by a certain element there. Reliable reports from Apia

advise that the party had found no accurate schedule except in Pago Pago, and that our hospitality was unequaled elsewhere.

The cost of this two or three months' trip, with a 10,000-ton ship chartered, must run up to several thousand dollars per day. Public opinion in New Zealand does not wholly indorse such expenditures.

ESTIMATED STRENGTH OF THE ARMY, 13 APRIL 1920.

Source: The Adjutant General's Office, Transportation Service.

17 April 1920.

	Officers.	Men.	Total.
United States	14,548	156,490	171,038
Philippines [1]	733	20,608	21,341
Germany [2]	716	16,750	17,466
Panama	201	4,365	4,566
Hawaii	204	3,635	3,829
Porto Rico	54	1,526	1,580
China	47	1,318	1,365
Alaska	20	871	891
France	73	5	78
Siberia	7	55	62
England	19	12	31
At sea:			
En route United States	92	1,907	1,999
En route Philippines	11	738	749
En route Panama	1	466	467
En route Europe	10	85	95
En route Hawaii	8	22	30
Total	16,744	208,843	225,587

[1] Includes Philippine Scouts, 236 officers and 8,334 men.
[2] Includes all troops under jurisdiction of commanding general, American Forces in Germany.

Commissioned strength 13 April 1920.

Officers.	Number.
Regular Army	8,340
Emergency, on duty	7,657
Emergency, undergoing physical reconstruction	747
Total	16,744

MONEL AS A MATERIAL FOR INTERNAL-COMBUSTION ENGINE VALVES.

Source: Reliable.

6 April 1920.

The present-day aviation engine operates at much higher temperature than was considered possible a few years ago. One of the greatest problems in the development of such engines has been the securing of a suitable material out of which to construct the valves. The life of ordinary valves is so short and their service so unsatisfactory that an improved material is urgently needed.

In a recent paper presented to the English Institution of Automobile Engineers, the merits of different steels for this service are discussed. No mention is made, however, of monel metal, a material which recent tests at this bureau indicate to be deserving of serious consideration for this class of work. Exhaust valves of this material have given satisfactory performance in a 180-horsepower Hispano-Suiza engine during 130 hours of running time. Of this time, the first 90 hours were devoted to tests made primarily to study the behavior of the lubricating oils. The engine was operated for periods of about 6 hours each during which time it was developing between 130 and 140 horsepower at 1,800 revolutions per minute.

Examination of these valves at the end of 45 hours showed them to be badly pitted; they were ground just enough to reveal the condition of the valve seats and these, too, were found in the same condition, although no considerable drop in power had been noted. During the next 45 hours, the horsepower was substantially the same as during the first 45 hours, although a slight increase appeared during the first run following the replacement of the valves. The valves were then subjected to 40 hours service under conditions far more severe than those encountered in normal operation.

The engine was being used in connection with a study of preignition and for this purpose was operated at 1,800 revolutions per minute under full load for a period of from 4 to 20 minutes. During the greater number of these runs, preignition was intentionally produced resulting in extremely high-engine temperatures. As evidence of these high temperatures was furnished in one instance by the fusing of the electrode of a specially prepared spark plug, the electrode's melting point being 1,500° C. In fact, one of the evidences of preignition was that when the engine was shut down the exhaust valve in a cylinder that had been preigniting would remain red for nearly a minute after the valves in the other cylinders had become black. In spite of the severity of these tests, there was no evidence of power drop from leaky valves. At the end of 130 hours of running time, the condition of the valves and valve seats

appeared to be no worse than at the end of the first 45 hours. It would, therefore, seem that the pitted appearance which is a characteristic of this material has little effect on the gas-tightness of the valve.

JAPAN'S MINERAL PRODUCTION DURING NOVEMBER, 1919.

Source: Reliable.

4 March 1920.

(12912.)

According to a statement recently issued by the department of agriculture and commerce, Japan's principal mineral production during November, 1919, is as follows:

(120 momme equals 1 pound, 1 kin equals 1 pound, 1 koku equals 40 gallons.)

Gold	momme	147,963
Silver	do	3,473,025
Copper	kin	10,353,726
Iron	tons (French)	6,860
Coal	do	2,256,205
Oil	koku	164,420
Sulphur	tons (French)	4,405

If compared with November of 1918:

		Per cent.
Gold	decrease	14.4
Silver	do	12.2
Iron	do	3.1
Coal	increase	21.5
Oil	do	6.7
Sulphur	do	16.9
Copper	do	.8

The total for the 11 months of 1919, up to and including November is as follows:

Gold	momme	1,656,038
Silver	do	36,955,025
Copper	kin	116,435,043
Iron	tons (French)	68,769
Coal	do	23,596,836
Oil	koku	1,753,956
Sulphur	tons (French)	43,065

Compared with first 11 months of 1918:

		Per cent.
Gold	decrease	8.1
Silver	do	19.5
Copper	do	6.5
Iron	do	8.3
Coal	increase	8.1
Oil	decrease	8.4
Sulphur	do	25.8

GERMAN COMPLIANCE WITH DISARMAMENT TERMS OF PEACE TREATY TO 15 APRIL 1920.

Source: Military Intelligence Division, General Staff.

17 April 1920.

This table shows, in per cent of complete compliance, the extent to which Germany has or has not fulfilled the principal disarmament terms of the peace treaty.

	Compliance.	Noncompliance.
Military and air clauses:		
Abolition of compulsory military service	100	.....
Nonmanufacture of gas	100	.....
Nonimportation of munitions	100	.....
Nonmanufacture of munitions	93	7
New tables of organization	91	9
No forts along the Rhine	88	12
Nonexportation of munitions	82	18
Size of standing army	77	23
No foreign military mission	72	28
No new armored cars	50	50
Nonmanufacture of air matériel	49	51
Surrender of munitions	33	67
No armed air units	27	73
Disbanding of all reserves	26	74
Abolition of general staff	25	75
Surrender of planes and airships	5	95
Disclosure of gas secrets	.....	100
Naval clauses:		
Surrender of warships	100	.....
Sweeping of mine fields	100	.....
No new warships	100	.....
Dismantling of fortifications	74	26
New tables of organization	74	26
Reduction of personnel	73	27
Submarines to be broken up	51	49
Surrender of naval munitions	33	67

JAPAN'S MINERAL OUTPUT.

Source: Reliable.

18 March 1920.

(5933-A.)

Japan's mineral production continues to decrease. The output of the principal mines during November, 1919, was 147,963 momme of gold, 3,473,025 momme of silver, 103,537,261 kin of copper, 6,860 French tons of iron, 2,256,205 tons of coal, 164,420 koku of petroleum oil, 4,405 tons of sulphur. The total output of these minerals for the 11 months, January to November, was 1,656,038 momme of gold, 36,955,025 momme of silver, 116,453,043 kin of copper, 68,768 tons of iron, 23,596,836 tons of coal, 1,753,959 koku of petroleum oil, 43,056 tons of sulphur. Compared with the previous year the figures

for last year show a decrease except in the coal production which resulted in a gain of 1,760,678 French tons, the others declining by from one-eighth to 258 per cent.

PETROLEUM PRODUCTION AND RESERVE IN THE UNITED STATES.

Source: Bureau of Mines, Department of the Interior.

17 April 1920.

The amount of petroleum now estimated to have been underground in the United States at the beginning of 1913 is 8,527,000,000 barrels. Of this, 2,165,000,000 barrels, or 25 per cent, were withdrawn during the seven years to the end of 1919. At this rate the present estimated reserves would be exhausted before the end of the year 1940. However, the rate of production during these seven years has been increasing about 6 per cent each year. If this continues the exhaustion point will be reached during the year 1931.

JAPANESE SMALL ARM AMMUNITION.

Source: Reliable.

4 March 1920.

(12911.)

A report from a foreign military attaché states that the Japanese war office, in October, 1919, was asked by the French mission in Siberia to furnish 10,000,000 rounds of rifle ammunition per month. The mission was informed that only 8,000,000 per month could be turned out.

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INTERNATIONAL.

WHAT AMERICA'S POLICY SHOULD BE IN CHINA.

Source: Reliable.

21 January 1920.

There was recently requested from one of the best known American writers and publicists in China his opinion on what should be done by the United States if she considers retaining the mastery of the Pacific Ocean.

The following was submitted on the condition it be not published (the style of the writer is too well known in China), nor his name in any way be divulged. It bears very careful reading as being the opinion of one of the best informed foreigners on far eastern affairs:

All foreign residents in the Far East have been watching during recent years, with feeling of increasing irritation and resentment, the growth and expansion of Japanese interests in China and the corresponding decrease in occidental influence and prestige. When Japanese interests expand, they expand both politically and commercially. Where Japanese commercial interests gain a footing, military and political interests are their closest camp followers. Where military interests are aggressive political and commercial interests are well cared for, and where political interests win a concession for themselves the military find a comfortable footing, and commercial interests expand under the most jealous protection.

It is absolutely impossible at any base of Japanese operations in China to distinguish between military, political, and economic interests. A theoretical divorce of these various interests has been useful to the Japanese in Paris, where there has been much talk of the economic rights which Japan is to have in Shantung; but to anyone who has lived in China such a divorce of interests on the part of the Japanese is wholly incomprehensible. Japan now has three big bases for expansion on the China coast—Fukien, Shantung, and Manchuria—and the promise of a still bigger field on the north in Mongolia. The prospect of the advances which Japan has been making from these various bases, in all her lines of endeavor, has been exceedingly depressing to interested occidentals because of the experience, common to all, that the establishment of a Japanese right means the extinguishing of all rights for all others, that Japanese trade supremacy means trade monopoly, and that supreme Japanese political influence means Japanese control. In the course of Japanese expansion China has suffered pretty severely in the loss of national property, national independence, and international

prestige, and has shown so little inclination or ability to take care of herself that the interested observers who find themselves damaged in one way or another through China's incapacity to keep the door open are often out of patience with China, and are inclined to think that a people who do nothing to save themselves are scarcely worth saving, and that if China is not to be wholly abandoned to the Japanese, as Korea was, there are only two alternative policies to pursue, the first, to pick a fight with Japan and drive her out of her holdings, both economic and political; and the second, to compromise with her and cooperate as far as she will permit it in the exploitation of China. Nearly all who are interested—diplomats, merchants, and mere lookers on—have almost given up hoping that China will evolve into a real nation with a real Government, strong, honest, and courageous enough to keep her doors open to international trade; and those who think at all about oriental affairs are either vacillating between the three schemes—(1) of abandoning China to the Japanese, (2) of fighting the Japanese, (3) of compromising and cooperating with them—or, having no thoughts or policies in the matter whatever, are making a feeble effort to compete with them through emulation of their methods. This last alternative, without a policy, seems to have been taken up during recent months by the diplomatic representatives of most of the occidental nations which figure in Peking. To prove that such activities are bound to be not only futile but extremely dangerous, and that a definite farsighted policy is most essential to all occidental interests, and particularly to American interests, not only in the Far East, but in every bit of the Pacific west of the three-mile limit, is the immediate purpose of this effusion.

China is only nominally a democracy. It is a country in which, through lack of communications and proper educational facilities, there is no articulate public opinion and therefore no representation of public interests. It is a country governed by groups of military leaders who hold their high positions through their ability to control useless armies of shabby, illiterate coolies. These leaders are so busy fighting out their local feuds and maintaining their positions that they have neither the time nor the inclination to study either local or national public interests and are forced to confine their energies to the struggle for self-preservation. They have no policy for they are opportunists, changing their colors, like the chameleon, from day to day, and shifting their allegiance from group to group, as expediency dictates, making alliances as petty as their wars and as devoid of policy, as we understand it.

Japan has found this state of affairs well suited to the advancement of her interests. Selfish and irresponsible Chinese officials have found that by accepting Japanese financial support and by

granting to the Japanese concessions in return for loans they are able to maintain themselves in positions of power and security. The chaotic condition of the Government has made united effort against Japanese aggression impossible, and this has been so valuable to Japan that it has been her whole policy to keep disorder at the highest pitch by financing at various times the various elements which promised to create the most trouble. Through the pursuit of this policy Japan has alienated the Chinese people until now all the literate classes regard Japan as the national enemy and are slowly but surely organizing against her and against the Chinese militarists who have served Japan.

Japan is a frankly militaristic and imperialistic nation. Her position in international affairs has been earned through military achievement, and her rulers believe that her future prosperity and prestige will depend upon the maintenance of her military supremacy in the Orient. To this, for economic and strategic reasons, a control of Chinese resources and a predominating influence in her political and military affairs is absolutely essential. For Japan to be strong, China must be weak. This is the root of Japanese policy, and in Japanese minds the end justifies any means.

This is a game in which democracies can not compete. Emulation of Japan's policy on a big scale by either the diplomatic agents or the merchants of America, for instance, would be amply advertised by the Japanese and by others as well and would be promptly condemned by both the American Government and the American people. Emulation on a small scale only makes us ridiculous in the eyes of the Japanese and of the Chinese politicians who work with them and make patent to these latter our weakness in a contest in which we have no business to enter. The worst enemies of the Chinese people are their governors, particularly their military overlords. Japan finds it worth her while to cultivate these rulers and to ignore the hostility of the people, because she is in a position to play the game on a big scale and is reaping big rewards in her hold upon Chinese resources, communication and the like. It is folly for us to attempt to find allies in Chinese officialdom to work with us in enterprises similar to Japan's, because Japan can always outbid us with the full approval of both her rulers and her people and can secure the fruits of such labors with a show of military force upon Chinese soil which is not available to us and which would never be made available if our Government and people were aware of the methods pursued and the purpose behind the deal, or if they were convinced that it had merited and earned the hostility of the Chinese people. The Japanese can lend a group of Chinese militarists 50 millions, obtain a mortgage on a railway or so, or a group of mines, and after earning the last-

ing enmity of the Chinese people who are getting to be articulate in their expressions of opinion, ignore them with the full consent of their Government and the support of Japanese public opinion, and protect their holdings with garrisons planted on Chinese soil. Spurred to emulation, we lend the same group of officials 5 millions, get little or nothing in return, finally fail to put the deal through and back down before the opposition of Chinese public opinion, condemned for trying something not in our line and despised in oriental eyes for failing to put it through. The history of American enterprises in China during the last five years is a record of failures. Crooked deals, modeled on a Japanese pattern, have met with the same fate as honest commercial enterprises. The time has come when no Chinese of influence, unless he happens to be ruled out of the closed circle of those who share in Japanese profits, will associate himself with an American enterprise except as a speculation and then he takes care to withdraw as soon as it appears that the enterprise is in any way endangered. On the other hand Japan's record is a record of successes. We can not envy them, because these successes have been achieved by means which neither American diplomatic policy nor American public opinion could possibly sanction; but we have to admit that the Chinese who associates himself with a Japanese deal stands by it to the last because experience has taught him that the Japanese will make good in every undertaking no matter how scandalous, while the American fails in everything, no matter how reputable, and that their failure is particularly ignominious in deals which will not bear close inspection. Japan through her system of acquiring and protecting investments in China has earned confidence through success with the element now in power, and through this success has earned the hatred of the Chinese masses, it has also earned their respect, which is all that Japan demands. No occidental nation is in a position to earn either the same confidence or the same respect, because the agents of no occidental nation will receive the same support in similar projects; therefore it is absurd for England or America, or France, to attempt to compete with Japan on her own terms.

Since we can not play Japan's game, since we can not play it secretly because small stakes make no impression upon China's present governors, and since we can not play big stakes because our own people will not support us, we can not play with China's present rulers, who are wholly unrepresentative of Chinese public opinion. Our diplomatic representatives must nevertheless be accredited to something, and since Chinese public opinion has not yet evolved a government which we can recognize we have to find something which we can recognize de facto. Because official procedure forces us to

recognize a government de facto, which we know thoroughly well is no government at all, our diplomats find themselves accredited to whatever happens to be in vogue in Peking, however unrepresentative it may be of China or of the Chinese people. That they find themselves so accredited is by no means sufficient reason why they should trifle and dicker with the government that happens to be in power in Peking, or why they should commit American policy to a recognition of the militaristic institutions which Japan is supporting in Peking. Because Japan, operating in a country without a representative government, has seen fit to create a government according to her tastes is no reason why our diplomats should seek to give it "face" and prestige by approaching it diplomatically through Japanese methods of procedure. Lacking such procedure, our diplomats believe that there is nothing for us to do but watch Japan's maneuvers upon the Chinese stage with folded hands, or get out, or drive the Japanese out, or accept whatever the Japanese cared to share with us through cooperation. It would seem that it never occurs to our diplomatic agents or to our commercial folk that we might develop a policy of our own consistent with our own national ethics and above the standard which Japan has set for us in the Orient. It never occurs to us that we could of our own iniative do better than yield before Japanese impudence or emulate Japanese rottenness and that we might create a policy of our own which would be consistent with our dignity and at the same time command the respect of orientals.

Japan has bought Chinese officialdom, terrorized the Chinese Government, such as it is, and has antagonized the Chinese people, but she has achieved a reputation for success while we, in various petty endeavors have achieved a reputation for failure. The Japanese are indifferent to Chinese public opinion because through their much condemned deals they have obtained a hold upon the mineral resources and the communication of China which will stand them in good stead in time of war, and because they are now in a position to command through their agents in Peking a Chinese alliance with Japan in the event of a Japanese war with any occidental power.

This fact is fully realized by all thinking Chinese and disturbs them greatly. Intelligent Chinese, with a better appreciation of Japan's strategic position in the Orient than the average American, know that if Japan ever reduces China to the status of a docile auxiliary her position in the Pacific will be almost impregnable, and that American interests will never expand beyond the California coast without the consent of Japan; while if Japan is ever recognized by America as the master of the Pacific, China's independence and national integrity will be gone.

Chinese and Japanese of ordinary intelligence understand perfectly what is hidden from all occidentials, but naval and military

strategists. Chinese independence from Japanese control is absolutely essential to American free trade in the Pacific Ocean, and American free trade and freedom of action in the Pacific west of the 3-mile limit is wholly dependent upon China's independence and strength.

A study of the map of the Far East should be sufficient to convince any amateur strategist that a war between Japan and any occidental power, except perhaps a reorganized Russia, would be a very expensive affair and one in which Japan would start with tremendous advantages if she saw fit to stand upon the defensive. Off the coasts of Siberia, Korea, and China, Japan has an unbroken string of islands from Formosa to the Arctic, ending in Sakhalin. In the event of war, Japan could keep her fleet behind this natural barrier, keep open communications with China and Korea, and live upon the resources of these countries for an almost interminable period. The military strength of an opponent would not figure at all, because, without a vastly superior naval strength, it would be impossible to land men on any of the Japanese islands, and there is no single nation which could spare a fleet sufficient for such an undertaking. Belligerently inclined occidentals in the Far East who are convinced that war with Japan is not inevitable but desirable, get much satisfaction out of the great military strength which America showed during the European war, and out of the growth of the American Navy, which is now double that of Japan, believing, as one often hears, that the American fleet could come over at almost any time and blow the Japanese fleet out of the water. It seems almost inevitable, however, that if America or Great Britain, or any other power, were involved in a war with Japan, the latter country would see fit to keep her fleet in the various seas behind her long barrier of islands, and to force her antagonist to expensive sacrifices in trying to rout her out. The American fleet in the Pacific is about three-quarters the strength of the Japanese Navy. Transporting this fleet to Japan would rob it of about 30 per cent of its efficiency, so that its strength would be just a little more than half of the Japanese Navy. The Atlantic Fleet could, of course, be brought into the Pacific, but no such move would be made until America had assurance from every European power of any strength of its absolute neutrality. Even then our effective strength in Japanese waters would be little more than Japan's and the Japanese fleet would have all the advantages of cover and of a ready supply of the materials of war close at hand.

A decisive victory over Japan under such conditions could only be accomplished by some very rash and very brilliant move on the part of the attacking force, and if a few attempts at such move-

ments were costly in ships Japan would have an advantage which would virtually amount to a victory.

In sustaining such a defensive contest Japan would rely very largely upon having Chinese resources at her command. The Japanese islands are not very productive of the minerals which go to make munitions of war, and at present Japan's own food supply scarcely meets the needs of her people. Her power of endurance in a prolonged conflict would therefore depend very largely upon her ability to get at the iron and coal deposits in China, upon which she now has a monopoly, and to keep communications open both by land and water. In the event of war, therefore, China's neutrality would be embarrassing and Chinese hostility might, if the pressure were strong enough from without, be almost fatal. It is to Japan's interest, therefore, to arrange matters in such a way in Peking that upon a declaration of war between Japan and any foreign power the Chinese Government could be forced into an alliance with Japan. If the Chinese Government was a democratic institution, controlled by intelligent public opinion hostile to Japan, it would not be easy to force it into an alliance, and Japan, pressed for the materials of war, would find herself forced to make war upon China. If China were then, as now, weak and thoroughly disorganized this might not be much of an undertaking and would inconvenience Japan little more than an alliance. But a strong China hostile to Japan at such a critical time could be of enormous service to whatever enemy Japan had in the field. This in itself is a sufficient explanation of Japan's policy in China. First of all, China must be weak and disorganized. Secondly, the growth of democratic government must be hampered. Thirdly, the Chinese military force amenable to Japanese discipline, must be organized as a weapon with which to force an unwelcome alliance upon the Chinese people. Fourthly, Japan must have strong bases on the China coast, such as Foochow and Tsingtao, with good communications leading into the interior, so that a hostile China could be properly controlled and subdued, and so that food supplies and materials of war could be stored and shipped under efficient Japanese protection.

All of this the Chinese see clearly, and they look forward with horror to the possibility of a war between Japan and any foreign power, believing that under existing conditions such a conflict would be the end of China's national existence. If Japan were victorious in such a war, China would at once find herself in the position of a Japanese dependency, while if Japan were defeated China as her ally (the Chinese are convinced that such an alliance could be forced upon them) would be led to expect, if not actual dismemberment at the hands of the powers, a degree of foreign control which would only be less irksome than Japanese rule.

In the face of such a possible catastrophe China has no policy, though it would not be difficult for America to make a policy for China, if the Chinese people had any assurance that America would shape for herself a strong and consistent pro-Chinese policy.

As long as Japan feels that through her control of China her position in the Orient is impregnable, there is no hope of binding her to a strict observance of the principle of equal opportunity in the Far East, and at the same time there can be no security for American expansion and trade development in any part of the Pacific. A well-organized Chinese Government, controlled by Chinese public opinion, would on the other hand so materially weaken Japan's strategic position that it would be a simple matter to maintain the "open door" in China and to secure American trade and development in the Pacific against Japanese meddling. It is therefore apparent that a strong China is as essential to America in the Pacific as a weak China is to Japan's imperialistic ambitions, and by a strong China we mean one which democratic institutions control and not one governed by a small militaristic clique which Japan could bully or buy.

Since China's welfare is essential to America's future welfare in the Pacific, both political and commercial, the kind of a policy which America should shape for the Far East and should adhere to consistently with all her strength, is clearly indicated. We should give our strongest moral support and encouragement to every movement among the Chinese people which indicates an awakening of national consciousness. We should lend no money, sell no supplies, and give no moral support of any sort to the militarists who are Japan's most efficient agents in her work of blocking progress in China. On the other hand, we should use every effort both through diplomatic influence and through propaganda, to discredit the militarists in the eyes of the Chinese people. Every American investment in China should meet with the approval of those classes of Chinese which are opposed to the militarists, and are endeavoring to build up democratic institutions; and whenever it is possible such investments should be of a character directly beneficial to the Chinese people in their struggle toward democracy. It is commonly recognized that there can be no democracy in China until modern education and good communications are available to the people in every part of the country. China needs railways, telegraphs, schools, newspapers, and small industries more than anything else. Our whole attention should be given to the encouragement and development of such institutions. At the same time, American business people should be given to understand that trading with Chinese officials and selling them materials and supplies which are of no possible use to the Chinese people, but which are on the other hand designed to strengthen the hands of the

militarists against the people, is trading with the enemy and is disloyal to America's best interests.

In China personal relations play a larger part in public affairs than in any other country. It can be readily understood that among officials especially, who are not guided by any particular principle or policy in the conduct of public affairs, an appeal in the name of friendship carries much more weight than it does in countries where official duty and responsibility are taken more seriously. Careful attention should be paid to this in China and American diplomatic and consular officials should be chosen with a view to their adaptability and should be instructed to spare no pains in establishing close friendly relations with as many Chinese of all classes as possible. To this end a knowledge of Chinese is essential, and it should be America's policy to see that every American who intends to reside for any length of time in China acquires some knowledge of the Chinese language, and that every American official has the time, the funds, and the opportunity to travel about in China and make himself known personally to the greatest possible number of Chinese officials and men of influence.

ECONOMIC CONDITIONS IN CENTRAL EUROPE.

Source: A report made by Sir William Goode, British Director of Relief.

1 January 1920.

(12221)

Formation of Relief Missions.

The way in which these missions came to be formed constitutes an interesting link between allied cooperation during the war and the concerted action which has grown out of the war, more especially in connection with the assistance rendered to allied Europe by the United States.

The morning the armistice was signed Sir John Beale, the first secretary of the ministry of food, was asked to attend the cabinet. and it was then decided that all immediate steps for the relief of Europe should be taken. The Royal Commission on Wheat Supplies was specially convened to deal with the matter, and decided, as an emergency measure, to instruct British wheat vessels then at sea to make for Falmouth or Gibraltar instead of their original ports of destination, so that their cargoes could be quickly diverted to northern or southern Europe to meet any urgent relief requirements that might arise. Forty millions British army rations were transferred at the front to the Commission for Relief in Belguim for the immediate assistance of the people in liberated territory. The situation in its various aspects was discussed at special meetings in London of

the executive body of the Allied Food Council. Almost simultaneously President Wilson requested Mr. Hoover, then Food Administrator of the United States, to proceed at once to Europe to take such steps as were necessary to meet the already apparent dangers of Europe's food situation. On his arrival, consultations were held in London and in Paris between representatives of the British, French, and Italian Governments, at which Col. House acted on behalf of President Wilson.

It was evident that the Supreme War Council in Paris was not in itself fitted to deal with the highly specialized economic and other difficulties which would have to be faced. After much discussion as to whether or not the existing interallied food organizations were capable of handling the problems of practical administration throughout Europe, it was decided to form a special body consisting of two representatives from each of the four allied and associated governments. This body—the Supreme Council of Supply and Relief—held its first meeting on the 11th of January, 1919, in Paris, with Mr. Hoover as Director General of Relief, and Lord Reading, then His Majesty's ambassador to the United States, and Sir John Beale, as representative of His Majesty's Government. The mandate of this body was "to investigate and consider the requirements for relief in Europe and their relation to the general supply of allied and neutral European countries, and to determine the general policy of European supply and the measures which should be taken for its execution."

Meantime, at the suggestion of Mr. Hoover, an interallied commission had already proceeded to Vienna to investigate the economic situation in the former Austro-Hungarian Empire. On this commission Sir William Beveridge, K. C. B., then second secretary to the ministry of food, was the British representative.

At this time food was practically the only basis on which the governments of hastily created States could be maintained in power. More than half of Europe, including Germany, hovered on the brink of Bolshevism. Revolutions were of frequent occurrence. Over large tracts of Europe devastation had brought productivity to an end, and, even in countries which had been spared actual devastation, fertility had been reduced by about 50 per cent. Consequently, the short supply of cereals was required almost entirely for human consumption, to the exclusion of fodder for animals. As there were also little or no imports of concentrated feeding stuffs, a scarcity of meat and milk prevailed in most countries. The world's ports were congested with now useless war material, and the world's carrying capacity, owing to this and other causes, had decreased in far greater ratio than was proportionate to the actual decrease of shipping. On land, miles of

permanent way and numbers of large bridges had been destroyed, while rolling stock and railway yards were jammed with guns, ammunition—in fact, with everything but food for civilian populations. The sudden transition from war to peace, or rather to armistice, had produced a reaction of industrial inertia. The workers were tired, and this factor gravely accentuated the normal difficulties of converting war machinery to peace production. Then, too, the currencies of most of the new States were so depreciated as to render barter the only form of practical commercial interchange. The finances of the whole of the Old World were demoralized; half of Europe was unable to help itself, while the capacity of the other half to give assistance had been reduced to a minimum by war effort or by the indirect effect of the blockade. Everywhere economic and industrial chaos prevailed.

Under these conditions, and in the very early stages, the members of the Supreme Council of Supply and Relief realized that it would be impossible for them to "tidy up" Europe without extended powers and without including in their constitution such organizations as the Blockade Council, the Allied Maritime Transport Executive, the Allied Food Council, and other interallied bodies. The Supreme Council of Supply and Relief therefore decided to dissolve itself after a short-lived but useful career, and, on the request of its members, the Supreme War Council created the Supreme Economic Council, comprising five representatives, with ministerial powers, from each of the four governments, and representing, respectively, food, finance, shipping, blockade, and raw materials. Sections were formed to deal with each of these functions. A communications section was also created, and later a coal commission. Lord Reading returned to America, and Lord Robert Cecil, K. C., M. P., became the principal British representative on the Supreme Economic Council. Sir John Beale, who throughout had taken a leading part in the negotiations for the formation of some allied organization for the prevention of starvation and disorder, and who, practically at a moment's notice, provided effective British personnel from the ministry of food for that purpose, had returned to London, and the British missions came under my direction and were made part of the food section of the new organization, of which Mr. Hoover was chairman. Until April, the British missions were carried on the ministry of food vote, but were then transferred to the establishment of the foreign office.

On the request of President Wilson, Congress, on the 23d of February, 1919, approved an appropriation of $100,000,000 for relief in Europe, and a further $5,000,000 was contributed by the President from his special funds. In the same month an allocation for

European relief of £12,500,000 was made by the British Government. This was not available for Germany, but could be spent in the countries indicated in the tables inclosed in this despatch. The British allocation was primarily for the purchase of food supplies available from the United Kingdom and for the work of reconstruction and the purchase of raw materials. In May, after my representations to the treasury, £200,000 of this allocation was also made available as a grant of £1 for every pound raised and spent on relief work by unofficial relief organizations in the United Kingdom. This amount has since been increased to £400,000. Substantial assistance was also received from Canada and Newfoundland, who provided relief cargoes. Important contributions were made by France and Italy which, it is understood, will be found in the official reports of those governments.

Expenditure Through the Missions.

Under the machinery outlined in the foregoing paragraph allied relief missions were sent in January, 1919, to Poland, Serbia, Roumania, Turkey, Czechoslovakia, Hungary, Austria, Trieste, and later to the Baltic provinces and southern Russia. Allied railway missions were also sent to almost all of these countries under the auspices of the Supreme Economic Council. The primary duty of these missions was to keep headquarters at Paris continuously informed as to the requirements and conditions in the various countries, and to give locally all possible assistance and advice as regards shipping and distribution of supplies. Their reports at first were considered at biweekly meetings of the food section of the Supreme Economic Council in Paris, and subsequently at informal, but practical, meetings held in the Paris office of Mr. Hoover, who remained as Director General of Relief until September, 1919, when he returned to America. The magnitude of the undertaking may be judged from the fact that the area covered by the missions was approximately 1,200,000 square miles, with a population of about 130,000,000 souls. This does not include Germany, Belgium, northern France, or the Ukraine and European (other than southern) Russia.

From the termination of hostilities to the end of 1919, 1,900,000 tons of relief supplies were delivered to liberated countries and to Austria at an estimated cost of about £103,000,000. Over 1,000,000 tons, mainly of food supplies, at an estimated cost of £52,000,000, were delivered to Germany, for which cash payment was provided. In addition to this about 1,250,000 tons of food supplies, at an approximate cost of £67,000,000, were delivered to Belgium and northern France in continuation of Mr. Hoover's work as head of the Commission for Relief in Belgium; while Finland, also, received from the United States about 160,000 tons of food supplies,

for which cash payment was largely made. The total amount expended by the allied and associated Governments in relief in Europe, including ex-enemy countries, since last November exceeds $1,000,000,000, of which Mr. Hoover estimates that only about $320,000,000 is represented by cash payments, the balance being out of relief credits or as gifts. In the case of food paid for in cash it must be remembered that it was largely due to the efforts of the allied relief organization that the blockade was relaxed in order to prevent the suffering which would have ensued if food could not have been purchased. The relief total mentioned does not include various British and other Government credits not specifically advanced for relief, nor does it include relief undertaken by British armies in the several war areas. The details of the deliveries, for each country and for each commodity, will be found in table on page 94.

Policy.

It was apparent at the beginning of the work that, with an appropriation of only £12,500,000, generous as this was in view of the financial position of the United Kingdom, the most useful part Great Britain could take was to supplement relief in different parts of Europe rather than to assume sole responsibility for any one country or countries. With the approval of Lord Robert Cecil and of members of His Majesty's Government, I have pursued this policy. British relief missions were instructed that their main objective was to cooperate in every way possible in the common humanitarian task, and were particularly warned not to make relief the stalking horse of trade, or to endeavor to bring glory to the British flag by pasting it on every tin of sardines. They were also enjoined to keep clear of all political complications—a counsel of perfection, perhaps, because it is hard to drop an energetic young Briton, with some experience of organization, into a disordered country without inevitable temptation on his part not merely to do his own particular job well, but also to endeavor to set straight, on English lines, all the affairs of the state to which he is accredited and with which, as I found in practice, his heart becomes bound up. This temptation was particularly acute in some of the countries where for several months members of the relief missions were the only accredited British representatives, but I venture to think that the tribute which Mr. Hoover publicly paid before he left for America to the complete cooperation and unselfish service which he and the American representatives had received from British members of the scattered missions is sufficient proof that these temptations were resisted.

Work Accomplished.

Cooperation with the country which alone had large supplies and adequate finances at her disposal was the keynote of the work of the

British representatives on the allied missions throughout Europe, and the main objective of the officials at headquarters in Paris. It would have been an effective but probably inhumane advertisement to expend the whole of the £12,500,000 appropriation sanctioned by Parliament by sending immediately large quantities of supplies to, perhaps, two or three countries in need of relief and letting the others go breadless. Instead of this the money was to a large extent expended in providing just those requirements which the United States Government either had not at their disposal or could not provide out of the congressional appropriation. This aid frequently took the form of vessels provided by the ministry of shipping. Over 80,000 tons of United States Army surplus stocks, which certainly could never have reached their relief destination in the nick of time, and which possibly might never have reached it at all, were thus forwarded through British effort at a time when there was a real world-shortage of tonnage. It must not be imagined that British shipping was merely utilized in the work concerned with countries for which the relief appropriation was available. In foodstuffs alone British shipping delivered, between September, 1918, and August, 1919, 2,880,000 tons to France and 2,010,000 tons to Italy, under the obligation which guaranteed to France and Italy the constant use of the same amount of tonnage as was on their service at the end of October, 1918. In addition, despite the fact that the resources of British shipping were taxed to the full, about 370,000 tons of food were delivered in tonnage provided by the British ministry of shipping during the same period for the program of the Commission for Relief in Belgium.

In countries which, thanks mainly to American supplies, were momentarily removed from the food danger curve, British relief funds were used to supply railway material—for instance, £500,000 to Poland and large amounts to Roumania. On the same principle, and in addition to food supplies, 500,000 knitting needles, 2,300,000 yards of shirting, and 200,000 yards of cloth were sent to Serbia; 3,200,000 yards of cotton twill, £100,000 worth of boots, and over £160,000 worth of drugs and hospital material were shipped to Poland; 30,000 pairs of boots to Esthonia; and 1,000 tons of soap to Czechoslovakia. The understanding on which I worked with Mr. Hoover was that we should always try to fill the gap between what the United States could provide and what was required for the necessities of human existence.

In the case of German-Austria, however, matters were different, as Congress had decided that enemy countries were not entitled to benefit from the American appropriation. In consequence of this "impasse," and in order to relieve the bitter distress in Austria,

Great Britain, France, and Italy, each borrowed from the United States Treasury $16,000,000 to be expended in food supplies of American origin for Austrian relief, and agreed to share equally between themselves, out of their own resources, the cost of the freight involved. Lest credit may not be given where it is deserved, I record the fact that this arrangement for averting what in the earlier part of 1919 might have been a tragedy of famine, was due to the initiative of Mr. J. M. Keynes, C. B., the official representative of the Treasury at the peace conference in Paris, who acted as deputy for the chancellor of the exchequer on the Supreme Economic Council up to the 7th of June, 1919. Without his resourceful vision of an England humane, although victorious, it would have been almost impossible to carry out the finance in connection with British relief.

The variety and extent of responsibilities shouldered by the British relief missions in cooperation with their American, French, and Italian colleagues, will be gathered from the reports of the several missions. What will not be evident from these modest recitals of work well done is the value of the constant reports from the British representatives in the relief countries, received daily by telegraph and by special courier. In many instances these dispatches constituted the only sources of information from the disturbed areas of Europe, both for the political and military sections of the British peace delegation in Paris, and for the relief operations. During the brief reign of Bela Kun, British relief representatives, in pursuance of duty, though at the risk of their lives, constantly visited Budapest and reported upon conditions there. When Vienna was trembling in the balance between bolshevism and the existing government, British relief representatives were carrying on their work of humanity and laconically telegraphing, in the absence of any British minister, the casualties which were occurring almost at the doors of their office. Early in 1919, when Polish armies were fighting on four fronts, British relief representatives threaded their way through opposing lines with disregard of danger. The same fearlessness was exhibited by the same men in fighting typhus in various parts of Europe, and in the work of relief in such disturbed areas as that of Tiflis and Denikin's stormy line of march. The spirit of Drake is by no means buried in the waters of the Caribbean Sea.

Present Conditions in Europe.

In October, 1919, I visited most of the countries in receipt of relief. The impression left on my mind as a result of this journey round Europe and of the conferences I had with the Presidents and ministers of the respective governments is akin to despair. Everywhere I found never-ending vicious circles of political paradox and economic complication, with consequent paralysis of national life and industry. The new States of repartitioned Europe

seem not only incapable of maintaining their own economic life but also either unable or unwilling to help their neighbors. Daily and intimate contact with a problem so involved and so vast makes one hesitate to diagnose the disease and still more hesitant to suggest the remedy. However, I think no can read the reports of the missions without coming to the conclusion that the future of Europe east of the Rhine depends upon immediate action on the following points:

(*a*) Restoration of peace.

(*b*) Credits:

(1) For food in most countries.

(2) For raw materials in all countries.

(3) For stabilization of currencies.

(*c*) Transport:

(1) Rolling-stock and repair material to increase mobility of existing stocks.

(2) Increased production of coal, without which there can be no mobility of transport.

(*d*) Economic solidarity. Removal of existing trade barriers in order to assure full and free interchange between the newer nations in the fundamental necessities of national existence.

It is, of course, axiomatic that these means have for their end increased production.

Credits.

The economic reconstruction of all countries in southern and eastern Europe is to-day dependent upon their ability to establish relations with foreign financial and economic interests on a basis of reasonable profit, with an understanding that, while immediate assistance will be forthcoming for the development of their own assets, the lending financial interests will be willing to spread their profits over a term of years. But no group of, say, American, French, Italian, or English bankers is likely to make a long-term contract, except possibly upon highly speculative terms, with governments whose political existence and even whose assets and liabilities are, from day to day, of doubtful duration; hence the apparent improbability of credits being provided on a scale and on terms likely to be effective unless the allied and associated governments, and possibly the neutral governments, intervene with some comprehensive scheme to minimize the political risk which at present prevents the introduction of private foreign capital into these countries. Even a cursory examination of the immediate credit requirements in food and raw materials of Poland, Jugo-Slavia, Czechoslovakia, Austria, Hungary, and the Baltic Provinces will be sufficient to show that in the present state

of their finances the allied Governments alone are quite incapable of tackling the job. Full and far-seeing cooperation on the part of the United States would appear to be the only possible way of providing credits, without which a considerable part of Europe will reach a state of utter demoralization and even anarchy. Of one thing I am absolutely convinced, and that is that to continue to provide food without at the same time providing raw materials on which to re-establish industry is merely to aggravate the problem of Europe. Another issue which may just as well be faced is that neither the Allies nor the new allied States can reasonably expect American capital to be provided in the shape of credits for ex-enemy countries if the first fruits are to be taken out of these countries in the shape of reparation.

A number of reports has been received from the British missions and circulated to Government departments as to remedies for the present depreciation of the currencies in all these countries, particularly in the States which formerly constituted the Austro-Hungarian Empire. Some of the ablest authorities, whose advice I have been fortunate enough to obtain, believe that the solution lies in the establishment of an international currency. This, it seems to me, must involve an external and an internal currency in each of these countries. The drawbacks of such a system are obvious, and the whole question is so highly technical and complex that I refrain from expressing any opinion, merely recording the proposal as one which should be carefully considered in conjunction with any plan for comprehensive credits.

Transport.

The questions of transport and coal are so interlocking that I have classed them together. Everywhere I went I found chaos on the railways. In the earlier part of the year it was impossible to rely upon any relief supplies reaching their destination by land unless the trains were not only started on their way, but "nursed" at frontier points by allied soldiers. To some extent this was due to political causes and to the technical continuance of hostilities as between the various countries, but in the main this escort was necessary merely from the point of view of railway dislocation. To-day—that is to say, January, 1920—the few trains of food supplies that are coming through from Poland to Austria are escorted by British soldiers, who, owing to the dissolution of the American and some of the other allied relief and railway missions, are now doing the major part of this invaluable work.

In all the economic welter of Europe there is no more perplexing vicious circle than that of coal and railways. In countries where I found wagons I found, almost invariably, a shortage of locomo-

tives; where there were locomotives there was a shortage of wagons; where coal lay at the pithead awaiting transport there were no wagons; and where wagons waited, men were not available to work the coal. For want of coal in Austria whole trains of wagons stood idle on the tracks. There were locomotives, but you can not get up steam without fuel. In Jugo-Slavia and Hungary the lines were congested with empty wagons for want of locomotives. In Poland, where efforts were made to stimulate the production of oil fuel, there were not enough tank wagons to carry the increased quantity of oil. Sir Francis Dent (chairman of the Commission for the Distribution of Rolling Stock in the late Austro-Hungarian Empire), the reparation subcommission sitting in Vienna, and the allied railway missions in the various countries have all been working strenuously to straighten out this tangle. The European Coal Commission in Paris and its subcommission at Mahrisch-Ostrau have moved heaven and earth to increase the production and expedite the delivery of coal, and have achieved a certain amount of success. Up to December, 1919, over 1,800 "armistice" wagons and 285 locomotives were provided to alleviate the situation, and efforts are being made to obtain raw materials with which to repair locomotives and rolling stock worn out by the war. Sir Francis Dent urged that efforts should be concentrated on wagons requiring light repairs so that the coal emergency of Austria might be more quickly and more efficiently met. On the suggestion of Brig. Gen. H. O. Mance, C. B., C. M. G., D. S. O., chairman of the communications section of the Supreme Economic Council, the Supreme Council in Paris have decided to set up an international railway organization which will supervise the interchange of all the railway stocks of the former Austro-Hungarian Empire. By this means it is hoped to restore some sort of order out of the present chaos. But to do this effectually credits are needed for the purchase of rolling stock and material. It is also doubtful if there can be any satisfactory interchange of traffic until the armed forces of countries still technically at war with one another are removed from their frontier stations.

There is another regrettable feature of this transport tangle. It is epitomized in the following sentence from a report I have recently received from a British officer in one of the new States:

"Before one single truck can be moved from one station to another, various officials from the highest Government official to the meanest railway employee expect monetary gifts."

That, I am sorry to say, is true, not only of the country of which it was written.

The latest reports show a tendency to increased coal production throughout Europe—it is now about 80 per cent of the 1913 produc-

tion—but the natural tendency of the coal-producing countries to retain the prewar quantities for their own consumption will result for some time to come in a continued undersupply to noncoal-producing countries. Up to the date of this report it has been found almost impossible, despite entreaty and pressure, to carry into effect the arrangements made under allied intervention for supplying Austria with coal from Czechoslovakia, Poland, and Upper Silesia. The paralyzing effect of the lack of coal upon even those elementary efforts to restart industry which have been possible in countries such as Austria and Hungary will be apparent from the reports of the missions.

Economic Solidarity.

I proposed during my personal conferences with the Governments of Czechoslovakia, Poland, the Serb-Croat-Slovene State, Hungary, and Austria, that when peace was ratified there should be a conference between the ministers of these States responsible for the financial and economic policies of their respective Governments, with a view to breaking down the trade barriers which now exist, and to establishing some basis of unhampered interchange in the fundamental necessities of national existence. This proposal was welcomed by all the Governments. I found in each capital a growing realization that it was to the self-interest of the States of southern Europe to foster closer interrelation. On the other hand it has been impossible to secure the complete fulfillment of even one of the many compensation contracts entered into between the various States for the provision of food in exchange for raw materials or manufactured articles. The practical result of indefatigable work on the part of the British relief missions toward arranging these contracts has been disheartening. This is not so much due to racial or political prejudice or even to postwar bitterness as to the actual physical difficulties in the way of more or less insolvent countries trading between themselves. As a profession of policy there is probably no one of these Governments that will not adhere to the principle that it is to their own interest to trade freely amongst themselves, but there is a natural disinclination to put such a policy into execution when it involves taking bad money in exchange for good food or coal.

An example in point is the contract between Jugo-Slavia and Austria. The former country, one of the few with a surplus of food products, undertook to deliver 160,000 tons of food to Austria in exchange for manufactured articles, Austrian currency, foreign exchange, etc. Meantime, the Austrian krone depreciated to between 500 and 600 kronen to the pound sterling, as compared with a prewar basis of 25 to the pound, with the result that it became practically

worthless to the Jugo-Slavs, who, themselves in need of raw material, desired to sell their crops to countries where they required credits with which to purchase wool, cotton, etc. Up to the middle of December, 1919, only 4,000 tons of food supplies had been delivered to Austria on account of the 160,000 tons contracted for with the Jugo-Slavian Government. Again, in the case of sugar, the Czechoslovakian Government had an exportable surplus of sugar. They were under contract to the Austrian Government to deliver an amount which would have met Austria's minimal requirements. On the other hand, the Czechoslovakian Government, like that of Jugo-Slavia, is dependent for its national welfare upon imports of raw material, but has no credits with which to buy them. Practically its only security for loans or credits is its sugar crop, and a large quantity of this has now been pledged in return for external loans. Austria is therefore likely to have to obtain sugar by arrangement with the allied Governments if she gets it at all. These two instances—typical of similar incidents in other countries—are sufficient to show the economic misdirection which is occurring in the exchange of fundamental commodities. At the same time it is hard to see how this can be avoided, unless some comprehensive scheme is set up whereby the country in need of raw materials can obtain the credits necessary for their purchase without pledging as security in a distant market the surplus products which common sense dictates should be sold in the nearest and natural market. A suggestion has been made that the League of Nations, when it comes into active operation, might exert pressure upon its members for the proper fulfillment of intergovernmental contracts for the supply of fundamental necessities, particularly as between those countries whose struggle for existence is still ahead of them. It seems to me that this might well come within the practical range of the functions of the league.

Distress and Suffering.

In an endeavor to portray the economic chaos of central and eastern Europe one is apt to take it for granted that the world realizes the human suffering which inevitably follows in its wake. It is a horizon of so much suffering en masse that even those engaged in the work of relief may only be recalled to the individuality of it by a tug at one's overcoat in the snow-covered streets of Vienna from some numb child begging for the food which is not there, or by a glimpse into the typhus-stricken villages behind the lines where the Poles are still fighting Bolshevik Russia. Vienna, perhaps more than any city in Europe, visualizes the misery that arises from want of food and coal and from the cumulative effects of over four years of ruinous war. Here, in a city of 2,500,000 inhabitants, the sharp contrasts between prewar prosperity and present-day insolvency,

between the nervous rich and the starving poor, between the relics of ill-fated monarchy and a revolutionary but rather desperate government, stand out with brutal appeal to the imagination. Toward the end of 1919 I visited Vienna twice, first as director of relief, and on the second occasion at the request of Sir John Bradbudy, as British representative on the reparations subcommission for Austria. In the course of the duties intrusted to me by His Majesty's Government it had been an almost daily task for some years to assist in devising measures which might remove the peril of starvation, not from individuals or communities, but from whole nations. Contact in the abstract with such conditions must tend to accustom anyone to human suffering, but I confess that the conditions in Austria, and particularly in Vienna, stung familiarity into realization. For the first time in my life I found a whole nation, or what was left of it, in utter, hopeless despair. Inability to obtain a ration, in itself insufficient to support human life, and the misery of hundreds and thousands who, in an early winter's snow, shivered without heat or the hope of getting it, were bad enough, but it was nothing compared with the apathy, the helplessness, and the loss of all hope that pervaded every class from the highest to the lowest. The report and recommendations which I signed as British representative on the Vienna reparations subcommission will be familiar to your Lordship and to the Governments to which it was transmitted. The relief measures which are being taken in the hope of palliating the present conditions are described in the report on Austria.

Yet actual starvation in Vienna, or deaths which can be directly attributed to it, present no such harrowing records as the official British reports in December, 1919, of the vilayets in Anatolia and Armenia, where want of food has reduced the inhabitants to almost inconceivable conditions. Vienna has no monopoly of suffering, and there is reason to fear, at the date of this report, that the conditions in the Austrian capital may soon find their counterpart in Budapest, while in Poland and some other parts of Europe there are grave emergencies for lack of food, coal, and transport.

In the case of Serbia, as will be seen from the report on that country, during the winter 1918–19 the population, having been evicted as a nation, returned to what was left of their country, and suffered intense privation. There are cases on official record of those whose only food a year ago was the roots of plants and the leaves and stems of maize; sacks in some cases were sewn together in lieu of clothes. Fifty per cent of the manhood of this people died in the war, and there are 500,000 fatherless children, of whom 150,000 are still in urgent need of care and education. It will be seen from the report on Jugo-Slavia that it is estimated that 35 per cent of the

population are suffering from clearly recognizable tuberculosis, while the total thus afflicted, including incipient cases, amounts to about 75 or 80 per cent.

Hand in hand with the disease and distress due to the cumulative effects of war and to the immediate lack of food and warmth is the specter of unemployment. In all these relief countries a considerable percentage of the industrial population is in receipt of unemployment pay. President Masaryk, of the Czecho-Slovak Republic, whom I saw at Prague on the 10th of October, 1919, pointed out that it was impossible to put his people to work without wool and cotton for the factories, and that the problem of this new State resolved itself into a question of the export of merchandise or of population. If raw material were not forthcoming, the industrial population would have to leave the country, and, unlike Great Britain or France, they had no colonies of their own to which they could go. As regards the agricultural population of this Republic, President Masaryk told me that the land had lost at least one-third of its productivity owing to the war losses of cattle and the consequent loss of manure. In the train of this vicious circle there had come a shortage of milk and consequent malnutrition of thousands of children. What President Masaryk said of his own country might, with little or worse variation, be said of every country where relief missions were stationed, and serves to emphasize the fact that credits are not needed merely for food in some countries, but for the raw materials with which to enable all the people to get to work.

Outlook for 1920.

With a view to summarising the outlook for 1920 in the various countries where the relief missions worked, I give the following brief résumé of the estimated requirements in food, raw materials and other imports:

Poland.

It is estimated that 500,000 tons of cereals must be imported in the year ending September, 1920, to supply the deficit of food in Congress Poland and the provinces of the east and the larger towns and also to provide seed.

Arrangements have been made with the United States to supply 100,000 tons of cereals, but shipping for a great part of this is still required. Raw materials in great demand include cotton, wool, iron and iron ore, tanning materials, fertilizers, jute, chemicals, rubber, vegetable oils, high-speed steel. Drugs are required for the campaign against typhus, which during the next few months is likely to be rampant. Large numbers of wagons, locomotives, and transportation material are also urgently needed.

Czechoslovakia.

Imports of cereals are needed before the next harvest to the extent of 350,000 tons, together with about 400,000 tons of potatoes. The latter can be obtained from Poland. Large quantities of raw materials are required, including wool, cotton, jute, leather, copper, tin, nickel, oilseeds, oils, chemicals, nitrates, and other fertilizers. Czechoslovakia is short of locomotives, wagons, and materials for repairs to rolling stock.

Roumania.

The local harvest has provided enough to meet Roumanian needs in the matter of cereals, and to enable Roumania to export fair quantities of wheat and maize. Cotton and wool manufactures and clothing, iron and steel, and agricultural and other machinery are needed. Tenders are being asked from America and the United Kingdom for locomotives and rolling stock.

Kingdom of the Serbs, Croats, and Slovenes.

Food requirements in the period 1919–20 can be supplied out of home production, and there should be an exportable surplus, estimated at over 1,000,000 tons of maize, wheat, and pigs. Cotton, wool, and clothing materials, also salt, fertilizers, and oils are badly needed. A supply of locomotives, wagons, and material for repairs is urgently required.

Austria.

In the nine months ending September, 1920, the minimum importation requirement of foodstuffs is placed at 632,000 tons. The minimum requirement of coal for 12 months would be 8,700,000 tons. Even if existing coal contracts between Austria and neighboring States are fulfilled, there will still remain a necessity for import by other methods of 2,400,000 tons of coal over 12 months. In December, 1919, Austria in practice was receiving under 50 per cent of the coal contracts arranged by allied intervention.

Nine hundred and fifty thousand tons of various raw materials, including wool, cotton, steel, chemicals, metals (chiefly copper and aluminum), oil, fertilizers, rubber, and jute are required in addition to large quantities of leather.

Hungary.

The official Hungarian estimate of food needed for import in the year 1919–20 is 380,000 tons of wheat and rye for human consumption; 1,433,000 tons of barley, maize, and oats for animal feeding, and industrial purposes; 53,000 tons of meat; and 63,000 tons of sugar. These estimates are subject to severe revision. There will, however, be absolute starvation in Budapest by March or earlier, unless Hungary is able to obtain from Jugo-Slavia foodstuffs for which

she has already paid in full. Imports of steam coal, cotton, wool, steel, locomotives, wagons and agricultural machinery are needed.

Baltic States.

Unsettled military and frontier questions in the Baltic States make estimates uncertain.

(*a*) *Esthonia.*—The influx of refugees which followed the failure of Gen. Yudenitch's attack on Petrograd seems likely to cause a slight shortage in grain supply. In addition the country is estimated to need this year 7,200 tons of rice, 7,200 tons of sugar, 72,000 tons of salt, 36,000 tons of herrings, as well as £60,000 worth of clothing materials, £25,000 of boots, and £44,000 of fertilizers. Small quantities of coal and of pig iron are also stated to be required. There is in Esthonia and the other Baltic States an urgent need of locomotives and wagons. The latter could be built in these countries if the materials were supplied.

(*b*) *Latvia.*—Given a supply of cereals from Lithuania, no serious deficit of foodstuffs seems probable. Coal, oil, and artificial manures and metal wares are required.

(*c*) *Lithuania.*—The past harvest in Lithuania has been described as the best in living memory, and a small surplus of grain should be available for export; of this surplus 6,500 tons will be required to make good the Latvian deficiency. The Lithuanian Government state that small quantities of clothing, fertilizers, and agricultural machinery are needed.

Russia.

In the event of commercial relations between Russia and the rest of the world being restored, Petrograd and other large towns in northern Russia will probably require to import food supplies from overseas, on account of the difficulties of inland transport. It is estimated that Petrograd alone will require at least 25,000 tons a month. South Russia, however, is likely to have a surplus of grain available for export, variously estimated between 1,000,000 and 4,000,000 tons. This is not likely to be available for export, except in exchange for imports of manufactured articles or locomotives and transport material, and of machinery.

The raw materials likely to be required for Russia are few in number, the country producing most things for which its industries are suited. Rubber and cotton are the principal needs apparent; manufactured clothing and colonial goods such as tea, coffee, and cocoa are in short supply. Manufactured clothing is badly needed.

Fuel imports will be necessary in the north, more particularly coal; oil also may be needed in the same area, unless the Volga route is used to the full during the navigation season, an unlikely contingency. Four million tons of coal were imported annually prewar,

mainly to Petrograd and Baltic ports, of which Great Britain supplied about 60 per cent.

In full working the cotton mills of Russia consumed about 1,500,000 bales of cotton per annum just previous to the war. The exclusion of the Baltic Provinces and Poland would reduce this figure for Russia about 40 per cent. The raw cotton consumed consisted about equally of Russian grown and imported. The Russian-grown supply has been reduced to very small proportions, as Turkestan has been forced to grow foodstuffs instead of cotton.

Armenia.

The country is to a large extent dependent on imported foodstuffs until next harvest. It is estimated that 6,000 tons of flour a month are required throughout 1920, owing to the large surplus population of Turkish Armenian refugees in Russian Armenia and lack of agricultural implements and animals, which limits the cultivation of the large acreage of wheat land available. The United States have provided credits for 35,000 tons of wheat, and have at the date of this report 20,000 tons in course of shipment in American vessels. Clothing and boots are needed, in addition to foodstuffs.

Georgia and Azerbaijan.

Georgia requires about 15,000 tons of flour during 1920, and has small amounts of manganese ore, tobacco, and wool to offer in payment. Azerbaijan, which is rich in oil, needs one cargo of flour during the next half-year to contribute to the feeding of a number of refugees—Tartars, Kurds, and Armenians—and of Russians, Greeks, Syrians, and Jews, who are unable to obtain employment or return to their own countries. It is important to furnish food to Georgia, if only to secure rail delivery of the supplies destined for Armenia, and to Azerbaijan to insure a supply of oil from Baku for the operations of the Armenian railways.

Bulgaria.

The 1919 crop was extremely good, and there is no necessity for the import of any foodstuffs. All requirements of cotton goods, clothing, manufactured articles, and raw materials will be met by ordinary commercial means, the state of the country generally being by no means unprosperous. The country is short of locomotives, wagons, and repair materials.

Turkey (i. e., the Turkish Empire as it existed before the war, less Syria, Palestine, Arabia, Armenia, and Mesopotamia).

There are sufficient foodstuffs within this area to meet the needs of the population, but the difficulties of distribution from one area to another are at the present moment almost insuperable owing to the unsettled situation and the breakdown in communications. It will therefore be found easier to feed large blocks of destitute refugees in

centers near to seaports by the import of foodstuffs. There is a large demand for cotton and woolen goods, clothing, transportation material and manufactured articles, but the information under this heading, owing to the extreme disorganization of the country and the absence of any help from Turkish governmental sources, is very scanty and incomplete.

Germany.

Not included, as not within scope of the relief appropriation.

Cooperation and Services.

It would be impossible for me to submit the reports of the British relief missions without paying sincere and grateful tribute to Mr. Hoover's leadership and work as Director General of Relief. In this appreciation I know that the British relief representatives, who have served in all parts of Europe, will genuinely concur. The extent to which catastrophe in Europe has been temporarily averted or minimized by the resourceful humanity and indomitable ability of Mr. Hoover can only be grasped by those who have worked with him. In all our daily consultations as to relief administration there was never at any moment the slightest thought on Mr. Hoover's part to make capital out of the far larger part played by the United States, and still less of taking any credit to himself. He played the game for the good of the side as a whole, and continuously made openings which enabled me to expend British funds economically and with a maximum of efficiency. The value of his legacy to Europe of the children's fund may be gathered from the fact that at the end of December, 1919, one cooked meal a day was being provided by American philanthropy for over 2,500,000 children, besides a supply of clothing.

As the parliamentary relief appropriation has now been nearly expended, and as all the British relief missions have been withdrawn, except those in Austria and Hungary, where they are retained at the urgent wish, not only of the Governments of the countries themselves but of the British diplomatic and other representatives on the spot, I respectfully bring to your Lordship's attention the services of the British officials who have carried on relief work since January, 1919. I have endeavored in this introduction to the reports of the missions to convey some idea of the problems with which they have been confronted and of the character of the work they have done. But it would be quite impossible for me adequately to describe the devotion to duty and the disregard of danger and discomfort which has been exhibited, often at the sacrifice of health and self-interest, by the whole of the staff. During the year which has just closed I have neither heard of nor received one single complaint as to lack of cooperation on the part of any one of the British representatives with their allied or American colleagues on these

missions; a proof, I venture to think, of tact, and sometimes of self-suppression. At one time more than 170 people, including personnel lent by the war office, were engaged in these duties. Where all have worked so well it is invidious to discriminate, but I would mention for your Lordship's information that the mission to southern Europe, which had its headquarters in Vienna, was in charge of Mr. Cyril K. Butler, who in October, after almost ceaseless days and nights of work of the most arduous character, broke down in health; the mission in Poland, established by Lieut. Col. S. G. Tallents, C. B., who was subsequently appointed commissioner for the Baltic Provinces, has been in charge of Capt. B. F. Crewdson since the 1st of March; the mission at Bucharest was in charge of Mr. W. H. P. Woodroffe, C. B. E., from its inception; the mission in Constantinople in charge of Lieut. Col. G. B. Pears, M. C., R. E., who was also invalided home; and the special mission to southern Russia and the Caucascus in charge of Lieut Col. R. J. McAlpine, O. B. E., D. S. O., M. C. There were also submissions at Belgrade in charge of Maj. J. Hanau, D. S. O.; at Prague, under Mr. J. Banister; at Trieste, under Mr. Owain Evans, C. B. E.; at Danzig, under Capt. Murray Harvey, M. C., now commercial adviser to the high commissioner; in southern Russia, under Maj. Pinder, O. B. E.; and at Tiflis, under Maj. Euan-Smith, O. B. E., D. S. O., who was invalided home. Mr. J. E. Munro is at present in charge of the mission at Vienna, and Lieut. Domaille is in charge at Budapest.

All these officers have informed me that they have received the most loyal support from their respective staffs. A number of clerical assistants in these far-flung posts of relief were women recruited mainly from the ministry of food. They exhibited both the courage and efficiency which we grew to expect from our womenfolk during the war. I should like to record my gratitude to all of these officers and the staffs of their missions, and also to the headquarters staff in Paris, where Mr. J. H. Gorvin, C. B. E., assistant director of relief, and Maj. C. B. S. Monfries, C. B. E., liaison officer with the treasury, rendered invaluable assistance.

It would have been quite impossible to carry on the work of the British relief missions with any degree of success without the whole-hearted cooperation in Paris of the members of the British peace delegation and of the British delegation on the organizing committee of the reparation commission, and in London of the officials of the ministry of food, foreign office, treasury, the royal commission on wheat supplies, ministry of shipping, and ministry of munitions. I gratefully acknowledge my debt to them. Invaluable advice was received from the premiers and representatives of the Dominions at the peace conference in Paris, particularly from Dr. J. W. Robertson, C. M. G., who, on the unanimous invitation of Mr. Hoover and his

allied colleagues, attended the meetings of the relief section on behalf of the Canadian Government.

Great assistance has also been received in the work of relief in the various countries through the contributions and personal services of unofficial British organizations, notably the Friends' Emergency Relief Committee in Vienna, the Friends' War Victims' Relief Committee in Poland, the League of Red Cross Societies, Lady Muriel Paget's mission in Czechoslovakia, the "Save the Children" Fund, the Scottish Women's Hospitals, the Vienna Emergency Relief Fund in London, and other bodies. British men and women, unostentatiously, but with as much selflessness as one meets on the field of battle, have gone into the remoter parts of Europe, with fine idealism, to alleviate distress. In several instances, due to the typhus they were endeavoring to suppress, they have sacrificed their lives. Three plucky British women met their deaths in this way.

Necessity for Action.

As I have already stated, the British relief missions have been withdrawn from all centers except Vienna and Budapest. The governments of the countries where our missions were previously established agreed with me, during our personal conferences in October, that no really useful purpose could be served by the retention of government relief missions unless they had appreciable funds at their disposal. Lest this withdrawal of relief may lead to misconception on the part of Parliament or the public as to the needs of southern and eastern Europe, I reiterate the urgent need of substituting for relief some comprehensive scheme of credits in order to remedy the situation which I have endeavored to project. I am gratefully aware of the fact that the recommendations which I have made from time to time have received from the prime minister, from your Lordship, and from the other members of His Majesty's Government a consideration which could only spring from a genuine and disinterested desire to alleviate suffering. I am also aware of the representations which your Lordship, in consultation with other members of the cabinet, has made to the Government of the United States in the endeavor to meet an emergency which, in its ultimate consequences, may be equal in gravity to the war. I venture again, however, to urge the necessity of immediate action. It is inconceivable that the conditions I have witnessed over half of Europe, and which are described in the reports of the missions, can be allowed to continue without a daily risk of political conflagrations such as that which now isolates Russia from the civilized world, and without the certainty of inflicting untold suffering upon the children and the women and the future generations of the liberated and ex-enemy countries.

DELIVERY OF RELIEF SUPPLIES FROM TERMINATION OF HOSTILITIES TO DEC. 31, 1919.

[Metric tons.]

Country.	Financed by—	Bread-stuffs.	Rice and pulses.	Pork products.	Condensed milk.	Cocoa and sugar.	Oils and fats.	Miscellaneous foods.	Seed grain.	Hospital supplies.	Railway material.	Clothing and cloth.	Miscellaneous supplies and not distinguished.	Total.	Approximate cost (pounds sterling).
Poland	United States	213,663	17,026	20,045	2,606	49	5,106	.....	.....	.....	.....	6,337	123,189	388,021	.....
	United Kingdom	2,889	1,362	1,255	.....	.....	.....	541	4,163	630	7,000	1,054	568	19,462	.....
Total	.....	216,552	18,388	21,300	2,606	49	5,106	541	4,163	630	7,000	7,391	123,757	407,483	27,624,500
Baltic States	United States	33,268	1,160	3,554	724	55	750	14	.....	.....	.....	.....	49,858	89,383	.....
	United Kingdom	5,271	303	.....	.....	.....	.....	.....	.....	.....	.....	300	.....	5,874	.....
	Sweden	150	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50	200	.....
Total	.....	38,689	1,463	3,554	724	55	750	14	.....	.....	.....	300	49,908	95,457	6,553,000
Northwest Russia	United States	19,048	380	1,845	1,056	.....	421	.....	.....	.....	.....	.....	1,660	24,410	1,413,000
Greater Serbia	do	50,209	1,528	2,487	470	.....	216	166	.....	.....	.....	.....	38,022	93,098	.....
	United Kingdom	10,359	3,831	985	381	52	.....	48	3,954	26	.....	1,532	12,490	33,658	.....
Total	.....	60,568	5,359	3,472	851	52	216	214	3,954	26	.....	1,532	50,512	126,756	10,517,200
Czechoslovakia	United States	291,875	1,418	20,384	1,618	.....	1,055	.....	.....	.....	.....	.....	39,344	355,694	.....
	United Kingdom	1,629	4,083	.....	300	.....	.....	.....	.....	70	.....	50	1,000	7,132	.....
	France	50	6,542	9,970	.....	.....	.....	9	.....	.....	.....	.....	.....	16,571	.....
	Italy	61,017	323	12,861	1,464	.....	.....	196	.....	.....	.....	.....	.....	75,861	.....
	Serbia	30	.....	520	.....	.....	.....	320	.....	.....	.....	.....	.....	870	.....
Total	.....	354,601	12,366	43,735	3,382	.....	1,055	525	.....	70	.....	50	40,344	456,128	21,817,600

Roumania	United States	96,244	1,045	2,526	2,772		353						42,354	145,294	
	United Kingdom	44,554	1,892	262							7,000			53,708	
	Canada	34,084												34,084	
	Newfoundland							2,350						2,350	
Total		174,882	2,937	2,788	2,772		353	2,350			7,000		42,354	235,436	11,656,100
Armenia	United States	42,959	3,684		3,466	1,000							24,289	75,398	4,040,000
South Russia	do	400											34,270	34,670	
	United Kingdom												100	100	
Total		400											34,370	34,770	2,613,200
Austria	United Kingdom	92,391		1,000	2,089		500	10,000					6,500	112,480	
	France	150,023	703											150,726	
	Italy	87,572	10,117	8,027	150			668						106,534	
	United States	2,307	2,846	2,535	2,554	730							5,708	16,680	
	Other countries	10,445	954	487		50,000		3,863						65,749	
Total		342,738	14,620	12,049	4,793	50,730	500	14,531					12,208	452,169	17,268,600
Total	United States	749,973	29,087	53,376	15,266	1,834	7,901	180				6,337	358,694	1,222,648	
	United Kingdom	157,093	11,471	3,502	2,770	52	500	10,589	8,117	726	14,000	2,936	20,658	232,414	
	France	150,073	7,245	9,970				9						167,297	
	Italy	148,589	10,440	20,888	1,614			864						182,395	
	Canada	34,084												34,084	
	Newfoundland							2,350						2,350	
	Other countries	10,625	954	1,007		50,000		4,183					50	66,819	
Total relief		1,250,437	59,197	88,743	19,650	51,886	8,401	18,175	8,117	726	14,000	9,273	379,402	1,908,007	103,503,200

Delivery of relief supplies from termination of hostilities to Dec. 31, 1919—Continued.

DELIVERY OF SUPPLIES TO ENEMY COUNTRIES (EXCLUDING AUSTRIA).

[Metric tons.]

Country.	Financed by—	Bread-stuffs.	Rice and pulses.	Pork products.	Con-densed milk.	Cocoa and sugar.	Oils and fats.	Miscel-laneous foods.	Seed grain.	Hos-pital sup-plies.	Rail-way ma-terial.	Cloth-ing and cloth.	Miscel-laneous supplies and not distin-guished.	Total.	Approximate cost (pounds sterling.)
Germany	United States	434,000	92,000	55,000	11,000	.....	27,000	.....	.....	.....	.....	.....	.....	619,000	.....
	United Kingdom	21,045	37,658	46,228	17,018	.....	31,496	145,669	.....	.....	.....	.....	.....	299,114	.....
	France	.....	.....	6,488	.....	.....	43,273	.....	.....	.....	.....	.....	.....	49,761	.....
	Neutrals	266	3	1,972	1,802	426	13,566	56,340	.....	.....	.....	.....	.....	74,375	.....
Total	.....	455,311	129,661	109,688	29,820	426	115,335	202,009	.....	.....	.....	.....	.....	1,042,250	51,871,900
Bulgaria	United States	22,862	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	22,862	1,020,000
Hungary	do	.....	.....	505	.....	.....	.....	.....	.....	.....	.....	.....	.....	505	71,000
Turkey	do	20,632	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20,632	877,000
Total	.....	498,805	129,661	110,193	29,820	426	115,335	202,009	.....	.....	.....	.....	.....	1,086,249	53,839,900
Grand total	.....	1,749,242	188,858	198,936	49,470	52,312	123,736	220,184	8,117	726	14,000	9,273	379,402	2,994,256	[1]157,343,100

[1] At £=$4.76, $750,000,000.

NOTE.—The following items are excluded from the above figures: British expenditure of £460,000 under £1 for £1 scheme; American Relief Administration deliveries to Belgium and northern France (estimated cost, $317,860,000), to Finland ($25,278,000), and for miscellaneous relief ($12,220,000).

VLADIVOSTOK—A CITY OF INTERNATIONAL INTEREST.

Source: Intelligence Officer, Asiatic Fleet. **12 March 1920.**

Before outlining the present disturbed conditions in Vladivostok brief mention should be made of the situation at the important points of interest in the interior of Siberia.

By the first part of March, 1920, the Red Army under the Moscow régime had advanced as far as Verdne Udnisk, a small city just east of Lake Baikal. This advance guard is backed up by a Red division at Irkutsk, a fair-sized city to the west of Lake Baikal. The discipline and equipment of these forces has been well advertised but probably exaggerated.

At present [date of report] these Red forces are impeded in their advance by the evacuation of the Czech troops and by the concentration of the Japanese forces at Chita. This city is the key to the central Siberian situation at present on account of its position near the junction of the Amur Railroad and the extension of the Chinese Eastern Railroad. It is here that the much-hated Buriat leader—Hetman Semeonoff—is still holding forth. (Hetman is the Russian title for general.) This leader has now but a few hundred men supporting him, most of them from the Buriat tribes in northern Mongolia. These remnants bear the name of the "Wild Division." This army of brigands and marauders that were formerly under Semeonoff and that claimed to support Kolchak, have to their credit the deaths of over 30,000 of the inhabitants of the Trans-Baikal district. It is generally believed that Kolchak never relished the support of this general but that due to his position on the line of communications that his very doubtful assistance had to be tolerated.

To further complicate matters around Chita, the Japanese are concentrating in that district the troops that have been withdrawn from the Amur line to the eastward. It is now a question as to whether these troops will be further removed to the Chinese Eastern Railway.

Still another disturbing element is made by the arrival in this vicinity of about 3,000 survivors of Kolchak's army. Originally this particular force boasted of 30,000. The survivors have traveled over 3,000 miles retreating from the Reds. They have gone on foot, on sleighs, and many had to cross the ice of Lake Baikal at a temperature of 50° below zero. Their suffering has been indescribable.

Thus the situation at Chita may be summed up as including a concentration of Japanese, a hasty passing through of some 10,000 evacuating Czechs, the approaching downfall of the hated Gen. Semeonoff with a probable attempt at escape, and a few thousand of the old White Guards mixing in without yet knowing where they

stand. And all of these elements are preventing the junction of the Russian Bolsheviki and the Bolsheviks who now hold the power in eastern Siberia.

Between Chita and Vladivostok there is another city full of appalling complications. This is Harbin. It is also located at the junction of two important railroads and very likely will be of world interest in the near future.

For in this city are located the headquarters of the Chinese Eastern Railroad, a line of communication which is the plum and kernel of the Siberian problem to-day. Its principal importance lies in the branch line from Harbin to the South Manchurian line which leads in turn to Japanese territory at Port Arthur. The greater part of the trade of Siberia may in the future pass over these two lines and as the world grows in need of the almost limitless resources of Siberia they will become of acute importance in international commerce.

The present contending parties at Harbin are approximately as follows:

(*a*) The old Russian railroad administration under Gen. Horvat, who is now dickering with Japan. This administration controlled the line under a lease from China. Its funds are short and it has no government left in Russia that could be relied upon for support.

(*b*) A Bolshevik faction that would like to see the road under the Bolsheviks with control from Vladivostok.

(*c*) Chinese interests that seek a purchase and return of the road to China.

(*d*) American advisory interests under Mr. Stevens. These will soon be withdrawn.

(*e*) Enthusiastic Japanese interests. It is frequently asserted that Japan is moving herself into a position where she will claim control of the road as compensation for her sacrifices in Siberia.

As considerable time must elapse before any government in Siberia will be stable enough to reclaim the lease from China it is quite probable that the line will come under the influence of some other power. Whatever the change may be, it is of such importance that it will exert much influence on coming Asiatic history.

These two cities, Chita and Harbin, are influencing the future of Vladivostok. Chita is preventing the unification of western and eastern Siberia. Harbin, if it should come under Japanese railroad influence, will seriously lessen the commercial importance and development of Vladivostok and in addition tend to prolong Japanese occupation of that city.

Coming now to present conditions in Vladivostok, let us take up the status of foreign troops, the foreign men of war present, the sani-

tary conditions, the political conditions, and the situation of the Japanese.

(*f*) Of the troops in Vladivostok, the Czechs at present have the greatest number, about 7,000. Approximately 18,000 have already evacuated and some 20,000 are left in Siberia. With the Czechs are included small numbers of Poles, Serbians, and Roumanians. These mixed forces were recruited early in the war from the prisoners taken by Russia that were hostile to the Central Powers, though forced to fight with them.

(*g*) The Japanese come next in number of troops having about 6,000 in Vladivostok and its immediate vicinity. There has been no definite announcement as to when they will withdraw. It is estimated that in all Siberia the Japanese have 55,000 troops. The distribution at the present time is as follows: The Fifth Division and one-third of the Fourteenth Division in the Trans-Baikal district with staff headquarters at Chita. Two-thirds of the Fourteenth Division evacuated from the Amur line to Havarovsk now located on the Ussuri line between Habarovsk and Nikolsk. Staff headquarters are at Habarovsk. The Thirteenth Division located in the sector between Habarovsk and Vladivostok, with staff headquarters in Vladivostok. The Sixteenth Division located in the sector between Habarovsk and Vladivostok, with staff headquarters in Vladivostok. The Sixteenth Division located on the Chinese Eastern and South Manchuria line, staff headquarters at Mukden.

(*h*) The Americans have about 5,000 troops left in Vladivostok and its immediate vicinity. Complete evacuation from Siberia is expected by the first part of April.

(*i*) The Chinese have some 3,000 troops on the Ussuri line to the north of Vladivostok. An attempt was made at one time to have these withdrawn. There are indications that this effort was blocked by Japanese pressure at Peking.

(*j*) The British, French, and Italian troops have been evacuated. Each of these powers still retains a mission in Vladivostok. After a short time it is expected that these will be also withdrawn.

The foreign men-of-war present at the time of the departure of the U. S. S. *South Dakota* on March 11, 1920, were the U. S. S. *Albany;* H. M. S. *Carlisle*, a light cruiser; H. I. S. M. S. *Hizen*, an old battleship, and C. R. S. *Hai Yung*, a Chinese cruiser. It might be of interest to note that the Japanese battleship was one captured in the Russo-Japanese War.

The health conditions in Vladivostok are not as serious as might be expected. The following influences have contributed toward the spread of contagious diseases.

(*k*) At Krasnoyarask, a city in central Siberia, on the railroad line, there were 7,000 cases of typhus among 23,000 prisoners of war.

It is reported that during the epidemic that over 300 deaths occurred daily. Troops returning from such conditions are bound to bring into Vladivostok many cases of typhus.

(*l*) A second factor is in the present state of extreme congestion in living quarters. The city before the war held about 90,000. At present there are about 350,000 and but little new construction of quarters has been added during the war.

(*m*) The yearly season, in which a shortage of water occurs before the melting of the snow and the arrival of heavy rains. Many of the wells have run dry and the city reservoirs contain at this time almost no water and but a foot of ice, which as it melts, furnishes an insufficient quantity of water. As a result of the shortage of water 12 out of 15 of the large public baths have been forced to close up. It should be remembered that during the winter time the majority of the Russian people rely on these baths. To increase the supply of water in the city fire engines have been used in outlying districts to pump water to harbor craft. The railroads have been able to obtain sufficient water to keep on running. It is expected that with the coming of warmer weather this situation will be relieved.

(*n*) Another contributing factor lies in the present high prices. There is plenty of food but due to its high cost there is a tendency for the poorer classes to be deprived of a full amount of nourishing food.

(*o*) The general insanitary condition of the streets also tends toward the spread of disease. The local government has no organization to remedy this. No taxes are at present being collected from the inhabitants, and there is as a result no funds available to undertake such work even if the government so desired. In years past it seems that the heavy rains that come each spring were relied upon to clean up the city. As these always occurred, the natives take it for granted that such a method will be sufficient.

(*p*) The hospitals at present are entirely inadequate for the number of cases of typhus, smallpox, and influenza. Such conditions force the presence of contagious cases in crowded homes.

(*r*) In the first part of March there were recorded 120 cases of typhus in five days. The cold weather, however, has passed and it is expected that the epidemic will break, as it usually does, with the arrival of weather that brings the inhabitants out of doors.

Political conditions in Vladivostok center around the expected change from the present zemstvo government to the soviet. The former originated as a sort of economic organization under the Czar's Government and served as an agency for the distribution of land to the peasants. The latter is the Bolshevik system based on popular representation from the working classes. In the past Bolshevik con-

trol has brought with it extreme disorder. At Vladivostok there are, however, influences that will prevent any serious disorders when the shift of government occurs. This shift may take place at any time as the Bolsheviks have practical control at present and in addition have the services of a recently arrived Bolshevik commissar from Moscow.

In estimating the possibilities of trouble in Vladivostok a logical division may be made into loss of life and loss of property. Affecting the possible loss of life there are three principal factors:

(*t*) The general attitude of the Bolsheviks points out that, without any doubt, the majority of them are desirous of the restoration of order. They are tired of atrocities.

(*u*) As Vladivostok is the only Russian seaport at present open to the world, conditions will be affected by foreign influences and foreign ships, even when allied troops are withdrawn. This to an extent which would lessen the possibilities of atrocities in Vladivostok, more than in any other Bolshevik city of Siberia.

(*v*) Internal trouble among Russians is being greatly lessened by the sudden development of their common desire to unify themselves against the Japanese.

In view of the above reasons, it is believed that there will be almost no danger to the lives of foreign residents. As to damage to property the following factors must be considered:

(*w*) At present the temporary government is supported almost entirely by requisitions. Formerly most of the supplies for Vladivostok were drawn from the interior of China and Siberia. These requisitions must be continued until transportation facilities are opened to the interior. It is believed, however, that the position of foreigners will be but little changed. The temporary government realizes that Siberia is in vital need of foreign commodities and that if foreign property is not made secure that the chances of receiving assistance will be dangerously lessened. This applies in particular to Americans.

(*x*) As the resources of the new government diminish it will be necessary to draw upon the wealth of the well-to-do. This will cause troublesome and disagreeable conditions for Russians in particular.

The position of the Japanese is at present the most critical problem in Siberia. Their situation is an element which is much more serious than the attitude of the Bolsheviks. It seems now that as a result of continued increasing friction between the Japanese and the Bolsheviks that war is possible.

The Russians are recruiting and training all of their young men, are planning to take to the hills to conduct a guerrilla warfare, and feel that as long as they are in a position to cut off the supplies

and transportation of the Japanese that they hold her interior Siberian troops in their power. Japanese officers on the front have admitted that they consider their western position hopeless in case war should break out.

The animosity of the Russian for the Japanese dates back to the Russo-Japanese War. With this animosity there are constantly coming up incidents which increase bad feeling. For example, the Koreans in Vladivostok recently organized a demonstration. Japanese troops were sent to restrict the area of this affair and keep it down. The Russians complicated matters by sending some armored trucks to inquire by what right the Japanese were violating the new sovereignty of Siberia. The Japanese replied that as yet they recognized no stable Government in Siberia. Any further attempt by the Japanese to disperse the Koreans might have resulted in fighting.

Again the Bolsheviks in the city decided that the tenants of a certain hotel should pay their rent to the soviet "lodging committee." This committee, it must be understood, sometimes divides the proceeds with the landlord. As the landlord in this case was a hard-working Japanese, he probably did not appreciate the socialistic ideas of the "committee."

The impossibility of the two peoples to understand each other forms another bad element. A peculiar instance in Japanese psychology that recently occurred may illustrate this. It was known that on March 12 a large demonstration was being planned to emphasize the desire of the Russians for Japanese evacuation. Two days before this Japanese quarters were decorated with their largest flags. It was in celebration of the relief of Mukden.

Again the Japanese occupy barracks needed by the Russians and they are quartered at the most important fortifications that guard the city. This last item is a constant source of irritation, as the forts were built at enormous expense for the purpose of keeping the Japanese out.

It is of interest to quote at this point the expressions of one of the strongest Bolshevik leaders in the city on the position of the Japanese. "With regard to the present attitude of the Japanese here in the Far East, it is evident that they are pursuing some specified policy. As far as it is possible to judge, Japan is not seeking any territorial compensation for the withdrawal of her troops from the Far East. She is conscious of the fact that Russia could not hope to put up a fight with her—a first-class military power—at the present moment. Therefore she is pursuing a policy of endeavoring to acquire economic concessions or treaties from Soviet Russia in lieu of pulling out her forces from Russo-Siberia. Her position with re-

spect to America is evidently causing her to pursue a policy that will liberate her from American hegemony, as America holds a grip on her with respect to her dependence for metals and other commodities. The supposition is that Japan will endeavor to conclude a special agreement with Soviet Russia on a commercial basis for the purpose of acquiring iron and other ores to keep her home industries intact. If Soviet Russia declines Japan's offers then it is possible that war will be the result, as Japan considers Russia weak at present. The Russians will fight to the last man, and although it may take a year, or probably two, to clear the Japanese out of the Far East, still it can be said with certainty that they will be ultimately driven out, because Russia's army is now a people's army, and is well equipped. In Soviet Russia the work of restoring the fighting standard of the Russian Army has been in progress now for some time. The army fell into such a state of disgrace that officers and men deserted it.

Lenine laid the foundations of the people's army by introducing the system of classifying all branches of labor, so that these officers who had forsaken the army and had taken up civil employment were reinstated and given responsible positions according to their degree of ability and military training. Lenine also took all workmen out of the army and sent them back to their industries. The recruits were drafted exclusively from the peasantry, so that to-day the Russian Army is a people's one and is equipped better than almost any other army in the world. It is supplied with the best food the country can produce.

Looking at the other side of the question there are several factors that lessen the chances of war between Siberia and Japan. First of all, such an event would stir up Korea and possibly China. The affair would be too costly for Japan and too risky in her relations with other big powers.

Second: Troubles in Japan at present are serious and would compromise such an undertaking.

Third. Japan realizes that if she can be the first to recognize the Bolsheviks and make peace with them that she will stand a much better, and much less costly, chance of developing her trade in Siberia.

In conclusion we might say that there are three steps open to Japan:

(*x*) Complete withdrawal from Siberia and the Chinese Eastern Railroad.

(*y*) Withdrawal from all of Siberia and concentration on the Chinese Eastern Railroad.

(*z*) Withdrawal from the Trans-Baikal district, leaving her in control of Vladivostok, the maritime provinces of Siberia, and the Chinese Eastern Railroad.

The course that she chooses is bound to have important and far-reaching influences on all of eastern Asia and upon all the powers interested in the Far East. Her choice can then be awaited with great interest.

CHINA'S NATIONAL DEBT.

Source: Reliable.

9 February 1920.

(11767.)

China's total indebtedness is about £215,000,000. The general opinion that China is overloaded with debt is entirely wrong; her debt compared with her resources is trifling.

Undeveloped resources must, of course, be classed as a speculative asset; nevertheless, in railway loans (which is one of China's greatest loans) there is very little of the speculative element.

It has been often stated that a railroad in China between any two points is bound to make money.

Two great factors of the last few years have tended to greatly help China—the first is that the sudden rise in the value of silver has reduced China's national debt about 40 per cent, the other factor is that the war has but slightly increased her debts as compared to Great Britain, whose national debt has been increased 10 times.

China's total foreign indebtedness appears to be as follows:

	Pounds.
1. War debt	30,000,000
2. Boxer indemnity	48,000,000
3. Railway loans	40,000,000
4. General loans	50,000,000
5. Japanese loans	30,000,000
6. Other short-term loans	17,000,000
Total	215,000,000

The tael (the value of the weight of an ounce of silver) fluctuated from 1900 to 1915 between 2 and 3 shillings; the tael to-day is worth about 7 shillings and every sovereign or dollar which was borrowed by China could be repaid for a half or less than half of what it costs her.

An enlightened and progressive Chinese Government could quickly pull China out of the hole.

JAPAN'S FOREIGN TRADE.

Source: Japan Advertiser.

18 February 1920.

(11324-A.)

Many interesting changes are observable in the records published by the finance ministry yesterday of Japan's trade in 1919 with other countries.

Japan's trade with Asia as a whole resulted in an excess of imports over exports, exports having come up to 955,145,647 yen, while imports reached 1,074,370,271 yen. While exports increased only 19,594,822 yen, imports increased by 261,657,688 yen. The principal factor which caused this change was Japan's necessity to import foodstuffs from India, Siam, Manchuria, and French Indo-China. Those countries imported rice into Japan. The Dutch East Indies imported into Japan more cargo than she bought from Japan and for this Japan's purchase of sugar from Java was responsible.

Trade with Europe.

Japan's trade with Europe resulted in an excess of exports over imports. Imports reached 162,969,641 yen while exports came up to 194,852,727 yen. However, the comparison of 1919's figures with those of 1918 displays quite a striking change in the Japan-European trade. Exports decreased by 103,403,791 yen, while imports from Europe increased by 80,182,786 yen. This increase in imports was especially visible in the records for Great Britain, Switzerland, and Sweden. Great Britain's imports reached 127,541,962 yen against 66,541,257 yen for the previous year, while Japan's exports to Great Britain reached 111,343,465 yen against 142,866,369 yen for the previous year. Switzerland's imports reached 8,643,398 yen against 2,278,193 yen for the previous year. Switzerland's purchase from Japan on the other hand decreased from 579,562 yen for 1918 to 408,007 yen. Sweden's imports reached 11,284,691 yen against 3,700,943 yen for 1918. France also increased her imports into Japan from 3,730,147 yen for 1918 to 8,831,291 yen, while her purchase from Japan fell off from 142,199,063 yen for 1918 to 66,813,482 yen. Any increase in Japan's exports was registered in records for Germany, Belgium, Holland, Sweden, Norway, Russia, Spain, Denmark, Turkey, and some other small countries and the size of gains was small.

With North America.

Japan's trade with North America resulted in an excess of exports, as shown below:

Countries.	Exports.	Imports.
	Yen.	*Yen.*
United States	828, 097, 621	766, 381, 438
Canada	24, 839, 553	6, 126, 416
Mexico	1, 155, 104	177, 853
Others	3, 002, 026	773, 779
Total	857, 094, 304	773, 459, 486

With Canada.

Only in the case of Canada both imports and exports decreased as compared with 1918. In all other figures as compared with 1918 a fair gain was registered. The trade with South America resulted in an excess of exports over imports, but it must be noted that both exports and imports fell away badly. Exports reached 20,830,445 yen, which figure was a decrease of 16,052,846 yen as compared with 1918. Imports reached 18,183,360 yen, which figure was a falling off of 2,694,596 yen. In exports the heaviest decrease was registered for Argentina and Brazil. The only increase was noted in the figure for Peru. In imports a decrease was noted in the figures for Argentina. The imports from all other countries increased.

With Africa.

The Japan-Africa trade resulted in an excess of imports, exports having reached 24,781,695 yen while imports reached 54,578,076 yen. Exports decreased by 23,420,120 yen from 1918. Imports increased on the other hand by 15,293,441 yen. Egypt and Cape Town are responsible for the substantial gain in imports. The trade with Oceania also resulted in an excess of imports. Imports reached 66,414,079 yen against 57,580,562 yen for 1918, while exports reached 46,155,278 yen against 82,915,460 yen for 1918. Japan imported a great quantity of wheat from Australia last year, it is to be noted.

CONSTRUCTION AND REPAIR.

H. M. S. HOOD.

Source: A Paper Read by Sir Eustace d'Eyncourt, K. C. B., at the Spring Meetings of the Sixty-first Session of the Institution of Naval Architects, March 24, 1920.

(12408.)

Following on the paper I read before this institution last year upon naval construction during the war, in which I gave a brief account of all principal vessels designed and constructed during the war period, I now propose to give an account of H. M. S. *Hood*, which will complete the series of big ships designed and built for the navy down to the present time.

Apart from the smaller craft, such as destroyers and patrol boats, of which an immense number were required during the war, the type of large vessel in which we were somewhat deficient in 1915 was the battle cruiser. It was known that the Germans were building several very important ships of this type, including the *Derfflinger*, *Lutzow*, *Hindenburg*, and others to follow. Our own vessels were later to be supplemented by the *Renown* and *Repulse*, and there were the very large light cruisers *Courageous*, *Glorious*, and *Furious*, but these three latter could not be regarded as battle cruisers in the proper sense of the term.

I, therefore, received instructions in 1915 to prepare designs of battle cruisers, embodying the latest ideas in regard to underwater protection, speed, etc. A considerable number of designs were submitted to the board, but as there were no large berths available it was not possible to place an order before the spring of 1916, and in March of that year the board selected a design of the dimensions given below to be worked out in detail. This design formed the original basis for the design of the *Hood*, having the same length and breadth as the *Hood*, but of considerably less draft, viz, 25 feet 6 inches normal and 29 feet deep, with a displacement of 36,300 tons on a length of 810 feet between perpendiculars. The speed was to be 32 knots, with machinery of 144,000 S. H. P. The armor, which was approximately equivalent to that of the *Tiger*, consisted of an 8-inch belt and 9-inch barbettes. The armament was to be eight 15-inch guns and sixteen $5\frac{1}{2}$-inch guns, together with two 21-inch submerged torpedo tubes.

I strongly advocated the adoption in this design of small-tube boilers, and these were accordingly included for the first time in the design of a capital ship. This feature had the most marked influence on the whole design, on account both of the smaller space occupied and the reduced weight involved, as compared with the space and weight which would be necessary for the large-tube boilers which had hitherto been adopted in all our big ships, including *Renown* and *Repulse*. The first big ships, though they can not be regarded as capital ships, as mentioned above, which had the small-tube boilers were the *Courageous*, *Glorious*, and *Furious*.

The original design of the *Hood* was approved by the board in April, 1916, and orders were placed to build one ship each with Messrs. John Brown, Messrs. Cammell Laird, and the Fairfield Co., the ships being named, respectively, *Hood*, *Howe*, and *Rodney*. Subsequently an order for a fourth ship, H. M. S. *Anson*, was placed with Messrs. Armstrong.

It will be remembered that the Battle of Jutland took place on the 31st of May, 1916. This, the greatest fleet engagement of modern times, naturally led to further consideration of the design of the *Hood*, which had only just been ordered; and in view of the damage which was done to our own battle cruisers and also to the German ships of similar type, it was deemed advisable to increase the armor protection, if possible. As the result of very extensive investigations, it was found possible, by accepting a deeper draft and a slightly reduced speed, to add very considerably to the protection of the vessels as already designed, without serious modification to the design of the ship as a whole. Accordingly, in September, 1916, definite proposals for increased protection were submitted. The alterations were of a very radical character, the armor belt being increased from 8 to 12 inches, and the barbettes from 9 to 12 inches, and certain increases were also made in the deck protection. The particulars, as thus finally decided, are given in Table I. At the same time the eight 15-inch gun mountings had their design modified to admit of an elevation of 30°, and certain other modifications were made both in the torpedo armament and also in the arrangements for preventing the flash penetrating to the magazines—a form of protection which was elaborated for all our ships at this time. All these increases involved an additional weight of nearly 5,000 tons, the legend displacement of the *Hood* becoming finally 41,200 tons when carrying 1,200 tons of fuel, the ship then having a draft of 28½ feet and a draft of 31½ feet with full fuel load, viz, 4,000 tons.

The original length and beam of the ship were maintained as before. Some extra plating had to be provided on the decks for strength purposes, but the underwater protection against torpedoes,

which had proved very efficient, was retained as in the original design.

I should mention also that the stability conditions were such that the increased displacement could be accepted whilst still maintaining a very satisfactory metacentric height.

All the modifications made in the design after the Battle of Jutland were considered in consultation, not only with the Board of Admiralty but with the commander in chief, involving, as they did, special arrangements for the fire and torpedo control, arrangement of bridges, etc.; and it was not till 1917 that the design was finally approved in all its details. This change naturally militated against the quick construction of the ship, and it will be about four years from the approval of the original design in April, 1916, to the time of her completion, this being about double the time taken to build our recent capital ships and nearly three times that taken to build H. M. S. *Repulse* and *Renown*. It is only fair, however, to say that the modifications were quite justified by the circumstances, and they have no doubt made the ship a much more powerfully protected one, whilst increasing her displacement, and consequently the weight of material to be worked, to about 50 per cent more than that of *Repulse* and *Renown*.

The main machinery, consisting of geared turbines to develop 144,000 horsepower, is the largest power which has ever been put through gearing, namely, 36,000 horsepower on each of the four shafts. The machinery is placed in three engine rooms, of which the forward one contains two independent sets for the outer shafts, the middle and after engine rooms containing one independent set for each of the inner shafts. This power, which was designed to give 32 knots for the earlier design of 36,300 tons displacement, is expected to give at least 31 knots in deep water at a displacement of 41,200 tons for the *Hood* as built. The trials,[1] which should take place at an early date, will be of very great interest in this connection. At the extreme load draft of about 31½ feet a speed of between 30 and 30½ knots should, I think, be realized.

The revolutions per minute of the propellers are to be 210 at full speed, and this admits of the adoption of propellers of higher efficiency than many we have had in our capital ships before gearing was introduced, when the revolutions were considerably higher. A good performance may, therefore, be confidently looked for on the speed trials of the *Hood*.

The boilers, 24 in number, as mentioned above, are of the small-tube type with forced draft, and are arranged in four boiler rooms. It was known that a great number of the later German

[1] See p. 150.

capital ships took advantage of the reduced weight and space occupied by the small-tube boilers and have generally adopted them in their recent designs. It is hardly necessary to say that oil is the only fuel used in the *Hood*.

The main armament of eight 15-inch guns is mounted, as in our recent battleships of the *Queen Elizabeth* and *Royal Sovereign* classes, in four turrets, all on the center line. The heights of the axes of the guns above the normal load waterline for each turret, commencing from forward, are 32 feet, 42 feet, 31 feet 9 inches, and 21 feet 9 inches. The big guns have very large arcs of training, the forward ones training to 60° abaft the beam and the after ones to 60° forward of the beam.

The antitorpedo-boat destroyer armament consists of twelve 5½-inch guns with shields 1 inch thick, these guns being arranged on the forecastle deck and shelter deck. There are also four 4-inch anti-aircraft guns on the shelter deck aft.

There are two 21-inch submerged torpedo tubes, each in a separate compartment forward, and four 21-inch above-water torpedo tubes between the upper and forecastle decks, these above-water tubes being a further addition since the original design was made.

The 12-inch armor belt has a length of 562 feet and a depth of 9 feet 6 inches. About the main belt is a strake of 7-inch armor to the height of the upper deck, and above that again there is 5-inch armor between the upper and forecastle decks. The side armor all slopes outward from below, as seen on this section, so that the virtual thicknesses are really somewhat greater, as the shell can not thus hit the armor normally. There is thick plating behind all the armor, varying from 2 inches over the greater portion to 1½ inches and 1 inch elsewhere.

The gun shields for the turrets are of improved shape, with rather flatter roof than formerly, and the armor has a thickness of 15 inches in front, 12 inches and 11 inches on the side, with a thick roof plate. The conning-tower arrangements has been very specially considered, and arrangements made, in addition to the admiral's conning tower, for torpedo and 15-inch gun-control towers, and 5½-inch gun-control revolving hood with range finder, in addition to the range finders provided in each turret. There are also smaller range finders in connection with the different controls.

The torpedo protection consists of the bulge arrangement, with an outer compartment of air and an inner one specially strengthened with the necessary separating bulkheads, etc. This protection extends throughout the whole length of the machinery spaces and magazines, and it can be said that it renders the ship as safe against attack from torpedoes under water as she is against gun attack above water.

The oil-fuel tanks are arranged along the sides, thus giving additional protection.

It is a somewhat curious coincidence that the first series of recent experiments on underwater protection should have begun by a set of trials of torpedo charges against the old *Hood* of the old *Royal Sovereign* class built in 1893. Developing the lessons learnt from these trials, which took place in the years immediately preceding the war, the bulge protection was first designed and fitted at the commencement of the war in the old cruisers of the *Edgar* type, to which I alluded in my last year's paper. A series of experiments was then made at the request of the Admiralty by the late Prof. (afterwards Col.) Bertram Hopkinson, F. R. S., in conjunction with myself, at first under the auspices of the royal society. These experiments, which were made on different scales, gradually working up to the full size, were of the greatest value, and the original protection fitted to the *Edgar* was modified and the details of construction as modified have been largely adopted in the *Hood*. I am glad to have this opportunity of paying special tribute to the work of Prof. Hopkinson and to his memory.

It may be noted that no ship provided with the original or the later form of bulge was lost, nor even seriously damaged by torpedo attack during the war, nor was there loss of life in any case, this being chiefly due to the special form of bulge and to its being external to the ship proper. By careful attention to the form the reduction in speed is only that due to the added displacement, amounting in the *Hood* to only a fraction of a knot.

Experience and trials have shown that the *Hood*, as protected, can receive the blows of several torpedoes and still remain in the line without serious loss of speed.

In the design of the *Hood* special consideration had to be given to docking, and she is provided with double internal vertical keels along the center line, and the docking keels come under the longitudinal bulkheads to support the ship on each side. Arrangements are made to dock the *Hood* in our larger docks, and she has already been docked and prepared for trials at His Majesty's dockyard, Rosyth.

I should like to add that it was never proposed to dock the *Hood* at Devonport, although one of the technical papers stated recently that it was discovered that she could not be docked there. Whenever a design is got out at the Admiralty, or presumably anywhere else, when fixing the dimensions, one of the first points to consider is, where the ship is to be docked; and this was done for the *Hood*, both in the case of the original design and again later when the protection and displacement were increased.

The *Hood* was successfully launched in August, 1918, at Clydebank, the ceremony being performed by Lady Hood, widow of Admiral Hood, who lost his life whilst gallantly leading into action the third battle cruiser squadron at Jutland.

The launching weight was about 22,000 tons. As the other three ships of the class which were commenced had none of them reached the launching stage at the time of the armistice, it was subsequently decided not to proceed with them, in view of the international conditions, and the *Howe*, *Rodney*, and *Anson* were accordingly scrapped.

The general strength of the ship as a girder had to be thoroughly investigated, both the original design and again when the protection and displacement were increased. Assuming the ship among waves equal to her length from crest to crest and one-twentieth of that length in height (a condition which I do not think is ever likely to be met) the maximum tensile stress on the top of the girder is less than 10 tons per square inch, and I may add that not one of our recent ships has ever exceeded this amount, although a slightly greater stress has been accepted in some recently designed Atlantic liners. The maximum tensile stress on the keel is less than the above, and the maximum compressive stress does not exceed 9 tons per square inch.

The following are some particulars of the general outfit:

Dynamos.—Eight dynamos are provided and are widely separated, two are driven by Diesel engines, two by turbo engines, and four by reciprocating engines.

Hydraulic pumping engines.—Four hydraulic pumping engines are provided for working the turrets; these and the other more important auxiliary engines are kept well away from the ship's side, as are also the necessary feed tanks.

Pumping and flooding arrangements.—Special consideration has been given to this item in the design of the ship, electrical bilge pumps have been provided, and also some 100-ton submersible pumps to deal with any water that may enter the ship. For fire and wash-deck purposes a fire main is run fore and after under protection with rising mains at intervals. This fire main is charged from 50-ton electrical pumps and also from the 75-ton steam-driven fire and bilge pumps in the engine and boiler rooms.

In the boiler rooms 1,000-ton turbo pumps are fitted; in each engine room the circulating pumps are arranged to draw from the bilges instead of from the sea, if required. Steam ejectors, each of 300 tons' capacity, are provided in the auxiliary machinery compartments and submerged torpedo rooms.

Steering gear.—The steering gear is of the right and left hand screw type, with connecting rods attached to a crosshead on the rud-

der head. Two steering engines are placed in the after engine room with shafting led through the shaft passages and thence aft to the steering gear. Auxiliary steering, on the Williams-Janney principle, worked by electric motor, is placed in the after steering compartment. The main telemotor system is continued aft, so that this gear can be worked from the main steering positions of the ship. The following steering positions are provided:

Conning tower;
Lower conning tower;
After engine room;
Steering compartment (auxiliary only).

Steering by hand power is not provided, as it had proved to be of little value with these very big high-speed ships.

Capstan gear.—The anchors, three in number, each weigh 9½ tons, and the chain cable is of 3⅜ inches diameter. Two cable holders and a middle-line capstan are provided, all connected to the capstan engine. A third cable holder is provided for the sheet cable for letting go only. At the stern a 3-ton anchor is provided, and the after capstan is worked by Williams-Janney gear driven by an electric motor.

Ventilation.—Special attention has been paid in our more recent ships, and perhaps more than any in H. M. S. *Hood*, to the system of ventilation, which has been worked out on the latest and most scientific principles; a great deal of experimental and research work having been done to get the best results. The main points to be noted are as follows:

The engine rooms are ventilated by four 30-inch and three 40-inch supply fans, and four 35-inch and two 50-inch exhaust fans, electrically driven. Each of the auxiliary machinery compartments has two 17½-inch electrically driven exhaust fans with "natural" supply trunks, all openings being well above the weather decks, in order that ventilation may go on as usual, even in bad weather—a very important point for the comfort and health of the crew. A very complete system of ventilation has been supplied to the seamen's heads, and to all water-closets, pantries, sculleries, paint stores, wash places, etc.; the ventilation being generally by means of exhaust fans leading direct from the open air. The living spaces generally are ventilated by trunks supplied by electrically driven fans. These trunks have openings so arranged that the air is delivered at a low velocity, and strong drafts which might be objected to are thus avoided and a gradual supply of fresh air, keeping the whole place sweet, is thus insured. Where necessary the air is passed through steam heaters for purposes of warming. In all these arrangements care has been taken to maintain as far as possible the transverse water-tight sub-

division of the ship, by avoiding the piercing of water-tight bulkheads. Each of the main transverse compartments is accordingly ventilated independently of any of the other main compartments, and thus the risk of water finding its way from one compartment to another in case of damage is eliminated.

Accommodation.—In all our recent designs great attention has been paid generally to the accommodation and comfort of the officers and men. Just before the war a special committee was appointed to inquire into the accommodation of ships, and a report was presented, and all the recommendations of this committe have as far as possible been embodied in our recent ships. The exigencies of the war and the additional requirements which had to be met as the war progressed, to some extent prevented all the recommendations of the committee being carried out; but in the *Hood* practically the whole of these have been embodied and great improvements have thus been made, recreation rooms being provided, and greater facilities for cooking and similar operations. In fact, a modern ship is in many respects a home of luxury compared to ships even 10 or 15 years old.

Electrically driven boat hoists.—Boat hoists, fitted with variable speed-control gear of the Williams-Janney type, driven by electric motors, are provided, and a weight of 16 tons, that of the heaviest boat, can be lifted and lowered at a rate of 60 feet per minute.

General design.—As regards the general design of the ship, the *Hood* may be cited as an example of what can be achieved by going to a large size. The endeavor has been in her design to embody the armament and armor protection of a first-class battleship, including also good underwater protection against torpedoes, and at the same time to give her the speed of the fastest battle cruisers. It has only been possible to do this by going to a great length and displacement. The underwater bulge protection is additional to anything provided in our prewar dreadnoughts, although these ships had internal bulkheads. The addition of the bulge, which has entirely superseded the provision of torpedo netting, involved a considerably increased weight over and above that of a ship of ordinary form; and although this additional weight was accompanied by a somewhat greater amount of additional buoyancy, it still involved an increased displacement with the accompanying increase in resistance to propulsion.

It may be argued that in such a large ship a great many eggs are placed in one basket, and that a very expensive one, but it would have been quite impossible to combine the speed, armament, and protection in a smaller unit.

In connection with the size of the *Hood* and general considerations of design, it is, I think, interesting to note that of recent capital vessels built, and taking the chief characteristics of two classes of

about the same displacement, in *Queen Elizabeth* we had a well-armored ship of about 28,000 tons, with eight 15-inch guns, and speed of 25 knots. In *Renown* and *Repulse*, of slightly less displacement, viz, 27,000 tons, though of greater length, we had vessels with 7 knots more speed than *Queen Elizabeth*, but with only six 15-inch guns against eight, and approximately about half the armor protection provided in the *Queen Elizabeth*. In the *Hood* we are providing the same armament, viz, eight 15-inch guns, as in the *Queen Elizabeth*, armor protection fully equal to, and in fact rather heavier in the aggregate than that of the *Queen Elizabeth*, 6 knots more speed than the *Queen Elizabeth*, which makes the speed nearly equal to that of *Renown* and *Repulse*, and in addition a full bulge protection against torpedo attack.

It is of interest to note that the American battle cruisers, which were originally designed with very light armor protection, have recently been modified in the direction of additional protection, making them thus more like the *Hood*, and in the Annual Report of the Chief of the Bureau of Construction and Repair for the fiscal year 1919, he says "On June 24, 1919, the general board recommended that battle cruisers be built as a distinct type, but the designs be changed to provide materially greater protection against gunfire and underwater attack, the resulting increase in displacement and reduction of speed, probably less than 2 knots, being accepted." This was approved, and the new plans necessary were gotten out. It is, I think, satisfactory that the American authorities, who have had full knowledge of what we have been doing in this country in the design and construction of warships, should have thus come to the conclusion that we were on the right lines, and have modified their designs accordingly.

As regards cost, which is about 6 millions, this, of course, is an enormous sum, but when the displacement and size of the ship and her qualities are considered, I do not think it is very excessive, in view of the present increase in prices. Most things have doubled in cost, and many of our prewar capital ships, complete with their armaments, etc., cost on the average about £90 a ton of displacement. The *Hood* is costing about £145 per ton, or an increase of about only 60 per cent above prewar prices, although she has qualities possessed by no earlier capital ship.

A good deal has been written and talked of lately about the surface capital ship being dead and the necessity for submersibles. But with our present knowledge it would be quite impossible to design a submersible ship which on the same displacement and cost had anything like the fighting qualities on the surface which are possessed by the *Hood*. Every ship is a compromise, and if, in addi-

tion to the ordinary qualities of a battleship, she is required to submerge, or even partially submerge, a very considerable percentage of weight has to be added to give her this additional capability of submergence. She becomes still more of a compromise, and the added weight must detract from the fighting qualities of the ship when on the surface, so that whatever is done, other things being equal, the submersible ship must be inferior to a surface ship in an ordinary action. There are many difficulties of details in the design of a submersible battleship which would take too long to go into fully now, and although there is no doubt that submarines are capable of great development, a little thought will make it clear to anybody that if naval warfare is to continue, the surface ship of the line must still hold the field as the principal fighting unit of any great navy. This view is apparently shared by other countries who are developing their navies, and both Japan and the United States are building large capital surface ships.

I should like to take this opportunity, on behalf of my staff and myself, of thanking the contractors for the assistance they have given us in getting out working drawings of the *Hood;* this applies not only to Messrs. John Brown & Co., who have so successfully constructed this, the largest ship ever built for His Majesty's navy, but also to the other three firms, who, in the earlier stages, helped us with the plans, until the time came when it was decided not to proceed with the three ships ordered from them.

TABLE I.—*Leading particulars of H. M. S. "Hood."*

Length between perpendiculars	810 feet.
Length over all	860 feet.
Breadth, extreme	104 feet.
Load draft (L. W. L.), mean	28 feet 6 inches.
Displacement at load draft	41,200 tons.
Shaft horse power of engines	144,000.
Speed at load draft	31 knots.
Oil fuel at load draft	1,200 tons.
Oil fuel at load draft	4,000 tons.
Armament:	
15-inch B. L	8.
5.5-inch B. L	12.
4-inch H. A	4.
21-inch torpedo tubes submerged	2.
Double 21-inch torpedo tubes above water	2.
Armor:	
Side, amidships	12 inches, 7 inches, 5 inches.
Side, forward	6 inches, 5 inches.
Side, aft	6 inches.
Bulkheads, forward and aft	5 inches, 4 inches.
Barbettes	12 inches.
Gunhouses	15 inches, 11 inches.
Conning tower	11 inches, 9 inches.

Protection:

Vertical plating, magazines, etc	1½ inches.
Forecastle deck, amidships	2 inches.
Upper deck, amidships	1 inch.
Main deck	[2] 1½ inches flat. [2] 2 inches slope.
Lower deck forward	1 inch, 1½ inches.
Lower deck aft	1 inch, 3 inches.

Weights expressed as percentages of displacement at load draft.

Item:	Per cent.
Equipment	2.0
Armament	12.5
Machinery	13.0
Oil fuel	3.0
Armor and protection [3]	33.5
Hull [3]	36.0
	100.0

REPORT ON EX-GERMAN LIGHT CRUISERS.

Source: Reliable.

(12965.)

General Particulars.

The *Emden* and *Nurnberg* are of the same class, the only difference being an increased length of 8 feet in the after superstructure in the *Nurnberg*, which involved a position farther aft for the aftermost gun. The *Frankfurt* is slightly smaller in length, beam, and depth and has Nos. 3 and 4 guns arranged on the upper deck level instead of on the forecastle deck level as in the other two vessels. It was impracticable to measure the length below perpendiculars and extreme breadth in all ships. The dimensions given below are approximate, having been taken from the prints and checked by rough measurements where possible.

	Emden and Nurnberg.	Frankfurt.
	Meters.	*Meters.*
Length over all	151	147
Length between perpendiculars	145	137½
Beam at upper deck level	14½	14
Depth amidships	8½	8

[2] Increased to 3 inches over magazines.

[3] The plating of the decks and side is required to be of such thickness for strength that it contributes very materially to protection. The weight of this plating is, however, included in "Hull."

The drafts were also recorded, but, as the vessels were partially flooded, these figures are not considered sufficiently valuable to include in this report. Taking the *Frankfurt* as an example it is to be noted that 42½ per cent of the length between perpendiculars is devoted to propelling machinery and boilers, whereas only 33 per cent is so used in British "D" class.

The vessels are fitted with twin screws.

Coal is the principal fuel, the 2 foremost double large boilers being fitted for oil burning, and the remaining 10 for oil and coal.

Structure.

All three vessels are built on the fore-and-aft principle, similar to the Isherwood system.

In the *Emden* and *Nurnberg* a wood deck about 2 inches thick is fitted in the waist only, the quarter deck and forecastle being covered with corticene or linoleum. In the *Frankfurt* no wood is fitted at all to any deck, and the weather decks are of bare steel with nonslip strips in the gangways.

Cabin, wardroom, office, and other such bulkheads are composed of two thicknesses of about 2 pounds galvanized plating, separated by wooden distance pieces of about 1 inch thick. They therefore contribute little to the structural strength of the ship.

A light steel ceiling is fitted on the ship's side and deck over all living spaces, and the space between is filled with cork.

Magazines are completely lined with wood.

Stanchions are generally lighter than fitted in British light cruisers, and as a result are generally bent and twisted out of shape.

Bulwarks are fitted complete in the waist with a long opening in way of the deck torpedo tubes.

It will be noted that water-tight subdivision is good, there being four separate boiler rooms. The very large submerged flat is the exception.

Water-tight doors are fitted with a sort of quick closing action in which a ratchet nonreturn clip or catch is embodied.

No escape scuttles are fitted to hatches of compartments occupied in action, but coamings one-half meter deep are fitted around all such hatches. All heavy hatches are fitted with a lever and buffer arrangement which apparently serves the dual purpose of balance weight and the ordinary door closing device.

Armament.

All three vessels are fitted with eight 15-cm. guns and two 8.8-cm. high angle guns arranged as follows:

Guns.	Location.	
	Emden and Nurnberg.	Frankfurt.
Foremost 15 cm. guns:		
Nos. 1 and 2	Abreast on forecastle	Abreast on forecastle.
Nos. 3 and 4	Abreast on forecastle deck level.	Abreast on upper deck level.
Nos. 5 and 6	Abreast on upper deck level.	Do.
No. 7	On top of after superstructure, superimposed over No. 8.	On top of after superstructure, superimposed over No. 8.
No. 8	On quarter deck	On quarter deck.
Two 8.8 cm. high-angle guns.	On casing top between after funnel and mainmast.	On casing top between after funnel and mainmast.

It will be seen that only five of the eight 15-cm. guns can be brought to bear on the broadside.

Torpedoes. One 50-cm. training deck tube on each side of upper deck at fore end of waist. Two 50-cm. submerged tubes fixed at 65° forward of bead.

Depth Charges. *Emden* and *Nurnberg*.—Two shoots on each side at after end of quarter-deck in recesses in upper deck covered by a flash plate level with upper deck. In *Nurnberg* these are closer together than in *Emden*.

Frankfurt.—Two shoots in blast-proof shelters arranged one on each side of quarter-deck on top of deck.

No machine guns were on board.

Protection.

This is in one thickness with no backing or shell plating behind. It is 6 cm. thick and worked in long lengths. It was easily drilled, which indicates that it may be of H. T. steel.

A complete protective deck similar to the *Frankfurt* is fitted. This is composed of one thickness of steel 2 cm. thick on sides and top. Over the steering gear in *Emden* and *Nurnberg* it is 4 cm. thick and the step down is 6 cm. thick. This was too hard to drill and may possibly be K. C.

The Diesel engine room and dynamo is situated in each vessel on the lower deck, starboard side, abreast the foremast. It is protected by a 3 cm. plate backed by 1 cm. and 1½ cm. shell plates on the ships side. At the upper deck it is protected by 3 cm. plating and at the

sides and back by 2½ cm. plates which extend down to the protective deck to protect the supports to the Diesel engine.

The conning towers are oval in shape, 12 feet 6 inches by 10 feet internal, being slightly flatter on the fore side. They are 10 cm. thick with a roof of 2 cm. The communication tube in *Emden* and *Nurnberg* is 4 cm. thick and 2 feet 6 inches diameter. It was impossible to measure it in *Frankfurt*, but it is probably the same.

The gun shields of 15 cm. guns are 5 cm. thick on the front face and 2½ and 1 cm. at sides, the top is 1½ cm. thick.

The gun shields of the 8.8 H. A. guns are 5 cm. thick in front and 1 and 1½ cm. at side, the tops being 5 cm. thick.

Magazines and Ammunition Service.

The ammunition is not fixed yet, both shell and ammunition are stowed in common magazines.

The magazines are fitted with a combined flooding and spraying arrangement (about 7 inches maximum diameter of pipe), but no gearing is led to the upper deck as in British vessels. The flood is taken from the pumps and not from the sea direct. The magazine lighting arrangements are more primitive than is usual in British practice, part of the leads being in some cases in the magazines.

The magazine cooling arrangements consist of a length of about 2-inch copper brine pipe which is led into the place and doubled once or twice and then out again. These are arranged just under the deck and are fitted with a drip trough.

The ammunition service is as follows:

Trunks, generally two in number and are fitted and run up vertically from the magazine to the service deck without a break, except in the case of the four forward guns in *Emden* and *Nurnberg* and the two forward guns in *Frankfurt*, in which cases the service is broken. These trunks are open at the magazine and no flashlight scuttle is fitted. The trunks are divided down the center by a plate fitted with foot and hand-grip holes all the way up. One side is used for shell cage and the other for ammunition. There is nothing corresponding to the British Clarkson case return tubes.

At the top of these trunks a water-tight cover is fitted which is of course removed when ammunition is being served, leaving the magazine quite open to the atmosphere. On the inside of this cover are straps for holding the whips in position. The top of the trunk is fitted on each side with a sort of Miller's flap.

Vertically above the top of the trunk are two electric motors. These are in a very exposed position and I should say they would be damaged very early in an action.

A system of transporting rails is also fitted along and above the weather decks between all such hoists on the same level, thus en-

abling a gun to be readily served from any magazine other than its own.

Ready use boxes 1½ cm. thick for ammunition are fitted in the vicinity of the guns.

A peculiar type of voice pipe is fitted alongside the ammunition trunks. The ferrotype sheet can not be fitted for exclusion of gas since the ammunition trunks down which they run are open to the atmosphere. It would appear that they are intended either for deadening the sound of gunfire or enabling the voice to carry better. It is suggested that samples be made on the lines of the attached and experimented with in order to ascertain the exact use of the fitting.

The ventilation of magazines is by trunk led off the supply to other services.

The torpedo head magazine is situated in the submerged flat itself. Ready-use torpedoes for deck tubes can apparently be stowed in lockers arranged on the upper deck under these tubes.

Searchlights.

Two 1-meter searchlights are fitted vertically one above the other on both the foremast and mainmast. These are operated by rods from the aftercontrol and bridge. No inclosed manipulating positions are fitted.

One small signaling searchlight 40 cm., is fitted to the bridge of *Emden* and *Nurnberg*, and two in *Frankfurt*.

Bridges and Control Positions.

The bridges of the vessels are somewhat larger than fitted in British light cruisers. It will be noted that there is no special place set aside for use as a control position only. The number of instruments on these bridges is considerably less than is usual in British vessels. On the other hand, the ships are fitted with large conning towers which is not in accord with the latest British practice.

There are four range finders in these ships; the one in the roof of the conning tower has a 3-meter base; there were two on the bridge and one in the aftercontrol; all are missing, but it would appear that these are probably the same size.

The bridges are fitted with steel and brass screens about 5 feet 3 inches high and with a curved wind deflector on the foreside. No triplex glass or other such screens are fitted to the upper bridge.

The after-control tower is an open structure about 15 feet diameter fitted round the mainmast.

The two foremost searchlights are operated by rod gearing from positions on the upper bridge; whilst the after pair are operated

from the after-control tower. In both cases the manipulating positions are somewhat exposed.

No protective plating against aircraft machine-gun attack is fitted to the bridge or control positions.

One steering position is on the lower bridge.

Accommodation and Messing.

Without a knowledge of the total complement it is impossible to say for certain, but it would appear that messing and sleeping accommodations for the " lower deck " is only provided for one watch.

Cabin accommodation is provided for on lower deck aft and in the aftersuperstructure as in British vessels. In addition to this, some cabins are located in the casings in the vicinity of funnels. A larger number of cabins is provided in the vicinity of the bridge than is usual in our vessels.

Mess tables and stools are made of pressed sheet iron covered with linoleum; they stow up under the beams and are not hinged on the outboard side. They are both neat and light.

A few wash basins are arranged in open mess spaces. They are missing now.

All mess decks are heated by steam radiators, there being no hot-air ventilation system.

Shoots for refuse from messes are provided through the ship's side overboard.

A typical cabin contains similar furniture to that in the British service, but there is not a particle of wood anywhere. Everything is made of pressed sheet iron. Bunks are generally arranged close to the deck and away from the ship's side.

The ship's galley appears to be only fitted for boiling by steam in the later vessels. It is understood that the German seaman lives on a kind of compressed meat, which on boiling expands. Much variety would certainly be impossible with the type of galleys fitted.

Officers' galley fire hearths are coal fired.

Wash places and bathrooms do not differ widely from British practice, except that all wash places drain directly overboard.

Anchor and Cable Arrangements.

Anchors very similar to British Hall's pattern are fitted, two bowers (stockless) and one sheet, the latter being stowed on the port side in an anchor bed just forward of the breakwater and fitted with the ordinary tumbler release gear. The weight of the sheet anchor is 3,500 kilograms, the weight of the others I was unable to ascertain.

The lower anchors in *Nurnberg* are housed into cast hawse, shaped so that the flakes are drawn right inside the shell plating.

The cables are stud link of 5 cm. and are fitted with a peculiar type of joining shackle, which looks like a link when assembled. It

is understood that several such links have been set to a dockyard for test.

A pair of combined capstans and cable holders are fitted and are worked by a steam engine situated on the platform deck. Provision is made for working by hand on both forecastle and upper deck simultaneously.

Cable compressors with tackles are fitted under the forecastle deck. The usual Blake and screw stoppers are fitted.

Large fairleads are fitted in bow and stern, presumably for towing.

An electrically driven capstan is fitted aft with hand alternative in *Emden* and *Nurnberg*. In *Frankfurt* a windlass is fitted aft.

The stern anchor is fitted in an open pipe on middle line at upper deck and is surmounted by a large fairlead.

Rig.

Two steel masts are fitted, apparently of equal height. The topmasts are also of steel. The diameter of mainmast is 2 feet to 4 feet at upper deck level and tapers toward the top. The height of the lower masts is estimated to be about 100 feet above upper deck level. No struts are fitted.

The signal yards are arranged in a novel manner. Four outriggers radiate from the mast just below the spotting top at right angles to each other. Jackstays connect the ends of them from which the signal halyards, fiddles, etc., are suspended. By this means flags are hauled out well clear of the bridge and signaling arrangements much improved.

All funnel guys are fitted with large springs.

Ventilation .

Ventilation sketches of *Frankfurt* will be found in the book of 1/200 drawings. The arrangement is typical. (It should be noted that supply is shown in red and exhaust in blue.) Instead of the number of various sized fans the Germans fit one or two large exhaust and supply fans for the fore and after parts of the vessel and lead trunks apparently without hesitation through decks and bulkheads. Where these are pierced a rather neat type of valve is fitted. It will be noted, however, that the fitting can only be worked locally and not from other decks as is the case in British light cruisers.

Magazines do not have fans to themselves, the ventilation comes off the same system which supplies storerooms or living spaces.

Generally speaking, all storerooms have fixed ventilation by trunk, no portable hose connection were noticed.

The boiler room ventilation supply trunks are fitted at the tops with a sort of jalousie stream line orifice.

Steering Arrangements.

This is of the usual screw type and is of somewhat massive proportions. The steam engine is fitted in the steering flat. Steering is from the lower bridge, upper and lower conning towers; after flat and auxiliary hand gear on top of casing by rods and gearing throughout.

Miscellaneous.

Boats davits are of the built-up type. All except sea boats davits are hinged.

The blast screen below the two superimposed guns is formed by a continuation of the deck and does not appear to afford the same protection as the type fitted in British light cruisers.

Steel hatch covers, water-tight doors, etc., are pressed in such a manner as to do away with the necessity for stiffness. Generally speaking, they are lighter than in our vessels.

There is no sign of any device for protection against mines.

Electrical fittings, such as junction boxes, etc., are made of light-pressed steel and appear to be neater and more satisfactory from a weight point of view than our service fittings.

Generally speaking, the sheet-iron work everywhere is excellent in these vessels.

There were only a few signs of welding and none on the ship's structure proper.

No awnings were fitted or provided for.

The scarcity of rubber in Germany was apparent in that water-tight doors and hatches were in many cases fitted with greased felt in lieu of rubber.

ORDNANCE

DESCRIPTION OF GERMAN GUNNERY BOOK.

Source: Reliable.

24 February 1920.

(12843.)

The following is an extract from The Engineer of 20 February, 1920, and is a review of a book Die Zwei Weissen Völker, by George von Hase.

Due to difficulties involved in obtaining technical information from Germany, a translation of this book will be published for the information of the service in succeeding numbers of the MONTHLY INFORMATION BULLETIN.

The author is Commander von Hase, and his book is entitled "Die Zwei Weissen Völker"—"The Two White Nations"—after a toast said to have been proposed, before the war, by a British admiral in honor of his own country and of Germany. Doubtless a feeling of mortification at the turn events have taken since 1914 induced Commander von Hase to choose that title. It is evident, from one of the concluding passages of the book, that he is deeply hurt at having been called a "Hun"—forgetful, or perhaps in ignorance of the fact that the offensive word was first applied to Germans by their own Emperor as long ago as 1900.

We are not, however, concerned with the author's political opinions, which he does not obtrude unduly; his book makes its appeal as the least biased and most objective narrative of the Battle of Jutland which has appeared in Germany to date. His qualifications as a chronicler are unusually high. In the first place, as chief gunnery officer of the *Derfflinger*, he was in an excellent position for observing all the main features of the battle, since the brunt of the fighting fell upon Admiral Hipper's squadron, of which this ship was a unit. Secondly, after the flagship *Lützow* was disabled, the *Derfflinger* took her place as leading ship, and maintained that place for the rest of the battle. Thirdly, profiting by his experience in former operations, Commander von Hase, on the eve of Jutland, had made elaborate arrangements for securing a complete record of the next important engagement in which he participated. One of his personal assistants, an old petty officer, was instructed to take down every order given him during the battle and every message received from the control station in the foretop and the transmitting station, respectively. For this purpose the petty officer wore a telephone headpiece, which was connected with the commander's, through which the latter maintained communication with the foretop and the

transmitting station. The petty officer was further to record the range, deflection, bearing, and other relevant data from each salvo fired by the heavy guns. The bearing was given in degrees, beginning with 0°, with the guns trained ahead. When trained on the starboard beam the guns were therefore at 90°, when astern 180°, and when on the port beam 270°. In the transmitting station an electrically controlled apparatus indicated in degrees the exact bearing of every gun turret at any given moment. Furthermore, the chronometer time at which each order was given and each round fired was duly recorded. Battle diagrams were prepared in each gun turret, in addition to the "plots" of the ship's course made in the transmitting station, thus providing data which subsequently enabled accurate charts of every phase of the action to be prepared. Finally, Commander von Hase had instructed his two assistant officers and every turret captain to note down everything of interest that came within their purview. As his book has been compiled from these records, its value as a guide to the German movements and gunnery tactics during the battle is obvious. We may add that the volume contains much useful information as to the German system of controlling fire, etc. For these reasons we propose to devote more than customary space to reviewing its pages.

Six weeks before the outbreak of war the second battle squadron of the then home fleet paid a courtesy visit to Kiel Harbor. As a mark of respect the German Government appointed a naval officer to act as aid-de-camp to Vice Admiral Sir George Warrender during the visit of his squadron, and that officer happened to be Commander von Hase. He was accommodated on board the flagship, H. M. S. *King George V*, and as his position brought him into close touch with all on board he was able to gain valuable impressions of the British Navy's readiness for war. In alluding to a conversation he had with the gunnery officer of the *King George V*, he observes that in contrast to the British Navy, in which the gunnery specialist enjoys high distinction, the practice in the Germany Navy was to exalt the torpedo above all other weapons. That tendency he deplores, quoting Mr. Churchill's dictum that "the premier sea power relies upon the gun, while the second strongest must pin its faith to the torpedo." "Because we did, in fact, place our hope almost entirely in the torpedo," says the author, "we abandoned to a certain extent the tactics of a great sea power. At Jutland—i. e., almost two years after the outbreak of war—the commander in chief, Admiral Scheer, dared for the first time to fight an artillery battle on the high seas, after both his predecessors, Admirals von Ingenohl and von Pohl, had neglected to seize the opportunities which were frequently presented to them of fighting a naval battle at sea." As a German admission that the grand fleet, far from being

"safely stowed away" at Scapa Flow, was frequently at sea for the first two years of the war, offering battle to the reluctant high sea fleet, this passage deserves to be noted.

Commander von Hase then proceeds to describe the gunnery organization of the *Derfflinger*. This battle cruiser, built by Blohm & Voss, at Hamburg, and displacing some 28,000 tons, was completed only a few weeks before the war. She had a main armament of eight 12-inch 50-caliber guns, mounted in four turrets on the center line, two disposed forward and two aft. The turrets were lettered alphabetically as "Anna," "Bertha," "Cäsar," and "Dora," but for the sake of convenience we shall refer to them hereafter by their initials, it being understood that A was the foremost and D the aftermost turret. A commissioned officer acted as turret captain in each turret excepting D, which was commanded by a petty officer. Fourteen 5.9-inch quick-firing guns constituted the secondary armament, seven on either broadside, each gun in a well-armored casemate. The only other guns on board were four 3.4-inch antiaircraft guns,[4] all the other 3.4-inch quick firers having been taken to arm German mine sweepers and merchant ships. The ammunition for these guns was stored in about 50 magazines, which were protected against underwater explosion by strong nickel-steel longitudinal bulkheads. The gunnery staff consisted of Commander von Hase as chief, 3 lieutenant commanders, 3 lieutenants, 4 sublieutenants, 4 midshipmen, 6 warrant officers, and about 750 petty officers and men. The complement of the *Derfflinger* numbered 1,400. Although the entire gun battery was in charge of Commander von Hase, in action he personally controlled the heavy guns only, the medium and light guns being controlled by two members of his staff. The forward G. C. T.—gunnery control tower—formed the rear section of the conning tower. In action it was occupied by von Hase, the third gunnery officer, 1 midshipmen, 2 range-finding numbers, 3 petty officers at the "training pointers," and 5 ratings to transmit orders. Immediately below the G. C. T., and separated from it only by a floor grating, sat 6 more communication men. Below this, again, were 1 petty officer, 2 communication numbers, and 1 artificer, constituting a reserve. In all, therefore, 23 persons occupied the main control station, which was protected by 14-inch armor. The second gunnery officer, with his staff, were in the after-control station, while the "spotting officer" sat in the foretop 115 feet above the water line. A description is given of the ship's range finders, seven in all, manufactured by Carl Zeiss, of Jena. It is claimed that they gave excellent results up to 200 hectometers, 21,800 yards.[5] The

[4] The German term for antiaircraft gun is "Flak," an abbreviation of "Flugzengabwehrkanone."

[5] In the German Navy ranges are given in hectometers—i. e., 100 meters=328 feet.

functions of the training pointer are also explained in detail. This instrument insures that all guns follow the movements of the periscope in the G. C. T. The "range clock" and other gear described in the book do not appear to differ essentially from the corresponding instruments used in our own service.

The following passage is of interest:

"For 10 years our [German] navy had been experimenting with a view to evolving an apparatus that would supersede the functions of the gun layer. Eventually we succeeded in producing a complicated gyroscopic apparatus by which the loaded guns could be automatically discharged at the moment when the sights were on the target. This apparatus allowed for the speed of the ship's roll, firing sooner in a quick roll than when the motion was slower. * * * This apparatus, however, was not on board at Jutland. We did not receive it until later." It appears, therefore, that the introduction of the Scott director antedated the German instrument by several years.

Describing the ammunition for the *Derfflinger's* guns, the author states that six projectiles per gun were kept ready in the turret bins. Two types of shell were used—armor piercing, painted blue and yellow; and high explosive, painted yellow. The charge was in a brass case, resembling a huge shotgun cartridge, save that the entire casing was of brass. The cases were expensive and difficult to manufacture, but their use was necessary in view of the wedge breechblock, the base of the cartridge acting as a gas check. Incidentally, the fact of the charges being inclosed in brass saved more than one German ship from the fate of the *Queen Mary* and the *Invincible*, as will appear later. The spent cartridge cases were ejected from the turret through openings in the rear wall. Including the men in the working chamber, handling room, shell room, magazine, and the gun house itself, each turret crew numbered about 80. The handling room acted as a reservoir for ammunition, and with the ammunition parties, hoists, and other gear working at high speed each gun was able to fire a round every 30 seconds.

"At Jutland," says the author, "I was able to maintain for long periods a high rate of fire, viz, four-gun salvos every 20 seconds." The 12-inch shell weighed 400 kilograms and the cartridge 150 kilograms. It should be added that a full charge consisted of a "vorkartusche," or secondary charge, in a double wrapping of silk, and the main charge in a brass case. These silk-wrapped secondary charges proved to be an element of danger in the battle. In bringing to a close his description of the *Derfflinger*, the author remarks that "in consequence of the higher speed possessed by every class of British ship in comparison with the corresponding German types, the former were, unfortunately, always able to choose their own range."

The German battle cruisers, which had been lying in the Shillig roadstead, off the Jade, during the night of 30th of May, 1916, weighed at 3 a. m. on 31st of May. The squadron consisted of *Lützow*, flagship of Vice-Admiral Hipper, *Derfflinger*, *Seydlitz Moltke*, and *Von der Tann*, escorted by light cruisers and several destroyer flotillas. The *Lützow* had been commissioned only two months previously. The *Derfflinger* went to sea with 1,308 men on board, and there were no leave breakers and only a few sick. During the bombardment of Lowestoft a few weeks before the *Seydlitz* had struck a mine, but the damage had been repaired. On leaving the roadstead the battle cruisers took station far ahead of the battle fleet, which consisted of 22 ships, comprising the *Konig*, *Kaiser*, *Helgoland*, and *Nassau* classes, and the best predreadnoughts of the *Deutschland* class. The *Friedrich der Grosse* flew the flag of the commander in chief, Admiral Scheer, and the fleet was attended by a large number of light cruisers and destroyers, screening the heavy ships from submarine attack and floating mines. The object of the sortie was to cover a raid by light cruisers and destroyers on enemy and neutral shipping in the Skagerrak during the night of June 1. "As it was probable that our presence in the Skagerrak would be reported, and that the British fleet would at once leave its base and make for the spot, an encounter with the enemy on 1st of June was reckoned as possible. * * * But no one in the German fleet had the faintest idea that the entire grand fleet was already at sea and steaming toward the Skagerrak. The British were equally in ignorance of our movements. * * * The Battle of Jutland was therefore a purely fortuitous encounter. From the first it developed like a carefully prepared mathematical battle plan in which, according to programme, first the light cruisers, then the battle cruisers, and lastly the battle fleets came into action."

"Half the guns' crews were manning the guns, the other half were sleeping in hammocks near their action stations. * * * I had no particular duties while cruising. The second and third gunnery officers kept watch and watch as gun-control officers. The captain had decided that the commander, the first gunnery officer, and first torpedo officer should get as much rest as possible while cruising, so that their nerves should be in good condition if the ship went into action. * * * As a rule I slept, read a book, or played chess, and at two-hour intervals made a round of the guns, to see that everything was in order. Usually I was accompanied by my messenger and a staff of mechanics to repair on the spot any defects that might reveal themselves, and within a short time I used to receive such reports as: 'Range transmitter of port No. 3 5.9 in gun in order again' or 'The defective left shell hoist of C turret has been re-

paired.' At 2 p. m. the bugle sounded 'Clean guns.' This meant that all save the officers had to go to their action stations. For the gunnery officer this is the most important hour of the day. At 'Clean guns' all machinery was tested, cleaned, and oiled, and all instruments were adjusted. I went from gun to gun. In turret B an ammunition hoist cable had jumped the block; on replacing it we found that part of the wire was badly damaged. I decided to replace it by a new wire cable, which would take an hour to fit. We fervently hoped the enemy would not appear for one hour. On 29th of May—i. e., two days before the battle—the fleet, after prolonged representations, had at last succeeded in obtaining several thousand gas masks from the army. The commander in chief ordered these masks to be distributed among the battle cruisers and the latest battleships. They were hurriedly issued on 30th of May, and it was now my business to see that each man had his mask handy. The emergency ammunition was already stored in the turrets. All the secondary guns were loaded in readiness to open fire on any hostile submarine that might break surface. Between 3 and 4 p. m. the commander, who was responsible for the ship's routine, turned over the guns' crews to me, and I proceeded to carry out gun and control drill, much to the disgust of my men. * * * Accompaned by the third gunnery officer, I went to the forward G. C. T. for control duty. We adjusted our head telephones and started: 'Normal position of switches for action port side.' In the T. S. about 40 levers were put over as ordered. I trained my periscope on our light cruisers and order, 'Follow the training pointer.' (Richtungsweiser.) All the other gunnery telescopes and all guns brought their electrical pointers in line, and were thus concentrated on the precise point of the target which I had told my direction petty officer to train upon. I called out, 'What is the E-U?' (Entfernungs-Unterschied.) The significance of this query should be explained. The first gunnery officer will at once be informed by the spotting officer what he estimates the closing or opening of the range per minute to be, assisted by his E-U instrument (change of range, i. e., rate). The range officer reports what change of range per minute results from the variation in the measured ranges. A report from the foretop is made: 'The new rate instrument is missing from foretop.' 'Good heavens! Get the thing from the gunner's stores at once. Gunner's Mate X. is to report himself to me after the drill is over. Foretop is to carry on with old rate instrument.'

"The improved rate instrument, as used in the German ships, was invented by Commander Paschen, chief gunnery officer of the *Lützow*. It served to determine both the change of range per minute and the deflection. Without going into details, it is enough to say

that the proper lateral correction is transmitted to the guns by means of a deflection dial for wind, speed of ship, and the rifling of the gun. To this must be added a correction for the speed of the enemy ship. Commander Paschen's instrument enabled one to read the deflection correction straight off without calculation after the estimated course and speed of the enemy had been set. The only allowance which the gunnery officer had to make was for wind. The main purpose of the E–U register was to calculate the change of range per minute. First, the speed of our own ship was set, this being passed at every alteration of speed from the main conning tower to the forward G. C. T. The enemy's course and speed were estimated next and adjusted on the instrument, from which the change of range could then be read off without any calculation being necessary. We had these instruments in many other parts of the ship, but they were mostly of an older pattern which did not give a deflection reading. Should the foretop be put out of action the gunnery officer could have the rate communicated from some other position, in which case the man working the rate pointer could not himself see the enemy. In these circumstances it was necessary, of course, for the gunnery officer to transmit through the voice pipe all information as to course and speed, and this seriously interfered with the work of fire control. Furthermore, each gunnery officer himself had a rate instrument beside him enabling him to check the reports which came through from the spotters, or personally to work out the change of rate should communications with the spotters be cut. The fire-control drill now proceeded. 'At 150 hundred' (15,000 meters, or 16,400 yards) salvo fire! The order to fire was thereupon transmitted from the T. S. to the 12-inch turrets by telephone and fire gongs. Immediately this order was given—or in action, at the moment of discharge—the splash operator (Aufschlagmelder), who sat behind the communication man in the foretop, in the gunnery-control towers, and in the T. S., pulled over the lever of the 'splash clock' (Aufschlagemeldeuhren), that registered the fall of the salvo. At the termination of a period corresponding to the time occupied by the salvo in covering the range every clock should sound a loud note, which really resembled nothing so much as the bleating of a flock of sheep. Through my telephone I ought to have heard this note simultaneously from the foretop, forward G. C. T., and T. S. Actually I heard only the clock in the foretop. On inquiring why the other clocks were not being worked, I was told that they would not act. I therefore ordered new elements to be inserted in all the splash clocks at once. And so the exercise went on until at length I had convinced myself that all defects had been discovered and that the guns of the ship were in perfect working order. With this pleasant conviction

I made my way to the wardroom and stretched myself on the sofa with a cup of coffee. I would like to have remained there for a long time, but at 4.28 p. m. the alarm gongs rang throughout the ship, buglers sounded 'General quarters,' and the boatswains' mates of the watch piped, 'Clear ship for action!' The Battle of Jutland was about to open."

REPORT OF THE CAPTAIN, H. M. S. "EXCELLENT," ON TRIALS CARRIED OUT WITH THE GOODYEAR BINOCULAR MASKS.

Source: Reliable.

26 March, 1920.

(12492.)

Trials have been carried out in the daytime at sea in a destroyer steaming at 23 knots in a strong head wind, and at night while firing 6-inch and 4-inch guns in conjunction with searchlights and star shell.

The face mask, either with or without head straps, is of great assistance in steadying the binoculars and cutting out the glare from the sun or water.

The mask also keeps the eyes from watering in a strong wind and protects the face from blast when working near a gun firing. The mask particularly saves the user from involuntary blow usually given by the binocular eyepieces to the bone over the eye socket when the gun fires.

The mask is very useful in strong sunlight or near searchlights at night, and when using it it is possible to look much nearer to the sun than with the binoculars alone, and to look near a dazzling glare for much longer periods without turning the eyes or making them water.

When using the masks during firing at night, the temporary blindness caused by the gun flash is much reduced.

The use of head straps to support the binoculars without the hand gives the wearer, at first, a feeling of having his head shut in a box, but this feeling is soon overcome when the binoculars and mask have been settled comfortably in place.

In small craft where there is much vibration the glasses are held more steadily by the mask and straps than they can be by hand, and the use of glasses is rendered easy where it would otherwise be impossible.

The feeling of being shut in when using the head straps is increased at night and never quite overcome unless the wearer can see the horizon or some definite object to give him his level.

The supply of the wind protector binocular support to ships, with its head straps, is recommended.

The supply of the head straps is recommended as, although as stated above they are not always required, their employment at times is of very great advantage.

With regard to the face pad for gun layers no further models have been inspected at Whale Island, but introduction of a fitting on the same lines as the binocular masks is recommended.

AVIATION.

RECOGNITION OF NAVAL VESSELS FROM THE AIR.

Source: Reliable.

6 April 1920.

(12957.)

During the war, as is well known, the question of recognizing enemy vessels was given the most careful study in the British Navy. Small instructional models of the different ships according to scale were very freely used in the training of enlisted personnel. All quartermaster ratings had to pass a very difficult examination.

Because of the present importance of reconnaissance by aircraft, the whole subject of recognition of enemy vessels has become enormously enlarged. In the last edition of Jane there were, for the first time, introduced photographs of naval vessels taken from the air as well as the ordinary photographs which simply show the side elevation. Not only is the Admiralty interested indirectly in air photographs of naval vessels because they appear in Jane's Fighting Ships, but even apart from such work as appears in that publication they are pushing the idea in the service. They intend, eventually, to collect air photographs of all of their ships. Even some time ago, during the war, the matter was considered sufficiently important to warrant studying the German ships in this way. Models were made. It was decided that three air photographs would be about the right number. One was to be taken from directly overhead. Certain of the aviators said that this would be one position where the plane would never be, but as a matter of policy it was decided that this particular kind of view was to be included in the sets. The other views were to be taken looking down at an angle of about 45° from broad on the bow and from broad of the quarter.

In these air photographs, the question of height does not enter. It is entirely a matter of the angle. The thing is to have the appearance of the ship viewed from above in these directions and one can either get off at a great distance and use good magnification, or come closer with a smaller camera and have the same size view. The pictures are about 2 inches long.

Photographs of the models of the German ships did not prove to be of any great benefit. The effect of light, no matter how the illumination was arranged, did not look very much like the real thing.

After many unsuccessful trials of photographing models, they made wash drawings of the different ships, shading in the manner which was found appropriate after studying a certain number of actual photographs of this kind taken of their own ships. Wash drawings about 18 inches long, in order to show sufficient detail, were made and these were so photographed that the ships appeared about 2 inches long. On each sheet there is a view of six or eight ships as seen from above, viz, looking down at an angle of 45° on the bow and looking down at an angle of 45° on the quarter. These views are placed on the same sheet and arranged quite close together that space may be economized.

There are certain general pecularities of such photographs. Ships with turrets in echelon are very readily distinguishable. Usually the photographs are taken with the turrets trained. Turret roofs appear as of a different color from the deck, depending on the light. Sometimes the turret roofs appear white and the deck black and again vice versa. But the main point is that there is always a contrast.

The turrets rather than the smoke pipes are the principal characteristics from the air. Breakwaters on the forecastle also show up very clearly wherever there is a break in the deck, i. e., not a flush deck but two decks showing on different levels, this becomes very conspicuous because of the shadow caused. Tripod masts are not distinguishable from the air. It is said that the yarn about the Germans bombing the *Blucher* because they thought from her tripod mast that she was the *Lion* or *Tiger* was very improbable as tripod masts do not show up well from above. This point was illustrated by a number of photographs.

From illustrations it is readily seen that, to recognize naval vessels from the air, we must depend upon an entirely different set of characteristics than heretofore used.

The present status of the matter is this, that the British Admiralty is convinced of the desirability and of the necessity of having air-recognition photographs of naval vessels. The idea will be to have standard photographs of this sort for ships of all navies. During the war it was considered so necessary to have something along these lines for the German ships that the work was done by photographing specially prepared drawings or pictures. The British Navy are planning that their own aviators will always be able to have this class of photograph of British ships.

1,100,000-CUBIC-FOOT SEMIRIGID DIRIGIBLE CONSTRUCTING FOR ITALIAN GOVERNMENT.

Source: Reliable.

25 February 1920.

(4856-B.)

This dirigible, known as *T–34* (34 meaning 34,000 cubic meters), was seen a few days ago in the hangar at Ciampino near Rome. The envelope is now completed and inflated and it is stated the dirigible will be ready for its first trial flights in from two to three weeks. The motors were installed, but the propellers were not in place. About half the gasoline tanks were installed. It is not thought that the first trial flight will take place as soon as predicted. The side curtains of silk which extend from the envelope proper and entirely inclose the keel were not installed, only two sections being in place.

The envelope contains 12 gas compartments instead of 7 previously stated. There are 3 air compartments. The motors are described as "ansaldo." They appear to be two 6-cylinder SPA motors inclined. There are 6 starters. They are arranged two forward, two amidships and two aft. They are not reversible. It is stated that two backing propellers are to be provided. These are to be used by unshipping any two go-ahead propellers and replacing them with the two backing propellers—a procedure which it is claimed can be done under way in about five minutes. The propellers are of wood. The rudders are installed and consist of three horizontal and eight vertical rudders, all mounted apparently on one frame. There were 6 large gasoline drums or tanks in position and space for about 6 more. They are mounted in one long line fore and aft just above the keel and extend practically the whole length of the available space. Several shorter drums were noticed between the long gasoline tanks, possibly three, one abreast each pair of engines, probably for oil. It was stated the total gasoline capacity was 12,000 kilograms. It was also stated each motor consumed 150 kilograms of gasoline per hour. The anticipated speed is as follows: All 6 motors, 120 kilometers per hour; 2 motors, 70 kilometers per hour. If the gasoline consumption as stated is correct the endurance and range is as follows: Six motors, 13⅓ hours, 1,600 kilometers (or 992 miles); 2 motors, 40 hours, 2,800 kilometers (or 1,736 miles). This is not consistent with other claims made, namely, that the range was three days with three motors. The truth is the ship is experimental and her performance can only be estimated. The lifting power is 20 tons in addition to weight of ship, including the motors. This is not in addition to the crew, fuel, and equipment. All this is included in the 2 tons. The lifting power is probably about 50 per

cent. A sea anchor will be provided. The bridge or control is just abaft the center pair of motors. The gasoline tanks are very thin sheet iron or steel.

COMMERCIAL AVIATION IN SWITZERLAND.

Source: Reliable.

5 December 1919.

(12494.)

It is reported that the aerial service between Geneva, Lausanne, Berne, and Zurich is no longer in operation, and that this service was discontinued because of poor results obtained. The mail, owing to numerous repairs needed by the motors, could not be expeditiously forwarded and passengers used it more for pleasure than for genuine commercial purposes.

The scheme, however, was not given up altogether, and a company was created in Zurich ("Ad Astria" Co.) with the aim of establishing aerial service in Switzerland, connecting the main aerial lines of the neighboring countries. The international line contemplated first to be established will join Geneva, via Zurich, and Friedrichshafen on Lake Constance, to make connection with the Zeppelin service flying between Friedrichshafen, Berlin, and Stockholm. The chief character of the new undertaking is that the service will be maintained by means of hydroplanes, which will light on the several lakes existing in Switzerland. Most of the principal cities in this country are built on fair-size lakes, allowing easy lighting facilities, practically in the center of the business districts, which is by far more advantageous than landing in distant aviation fields.

At present, the company "Ad Astra" is in possession of three hydroplanes, two of Italian make (Nieuport-Marchi), and a third made in Friedrichshafen work (Germany). It is a monoplane measuring 21 by 15 meters (68.90 by 49.21 feet) and weighing 4 tons. The wing surface is of about 80 square meters (262.45 square feet). Two gasoline motors developing a total of 540 horsepower drive two propellers, one in front and the other in rear, both above the body frame. The speed can reach a maximum of 180 kilometers (111.84 miles) per hour. A great speed is necessary (about 120 kilometers, equal to 74.56 miles per hour) to allow the hydroplane to rise from the surface of the water.

The body has the shape of a real aluminum boat with a pontoon on each side to prevent capsizing. In the front of the body is the seat of the pilot; in the center, a comfortable cabin for passengers contains six armchairs; in the back are two seats for the crew.

It is interesting to note that rudder, stabilizators, and small wings are of the biplane type and counterbalanced. This hydroplane came

to Geneva, 15 November, 1919, for demonstration flights, and remained in the city for several days.

The "Ad Astra" Co. intends creating next spring regular services between Geneva, Lausanne, Montreux, Bienne, Neuchatel, Lucerne, Interlaken, Zurich, Lugano, Lucarno, Thoune, and Romanshorn, each of these cities being situated on a lake affording ample space for easy lighting. It would not be the case of cities like Berne, Bale, Chaux-de-Fonds, where only ordinary airplanes could land.

The municipality of Zurich has already offered a convenient space to the company.

The pilots will be chosen from among the best military aviators.

MEXICAN NOTES.

Source: Reliable.

3 April 1920.

According to advices from Europe, 60 German bombardment aeroplanes, accompanied by at least 20 German pilots, have been shipped from Germany through a Spanish port destined for Mexico. It is asserted that the price paid per machine was approximately $7,500. There has been additional information received to the effect that a Japanese vessel left Hamburg for Mexico with a consignment of arms.

It has been unofficially reported that a German named Krum Heller, a Carranzista secret service agent, has arrived in Mexico from Germany, where he was military attaché during the war, for the purpose of securing through President Carranza, a concession from the Mexican Government for a German syndicate to establish a large shipbuilding yard at Manzanillo, Colima. It is said that the former German minister to Mexico, Von Eckhardt, is interested in the project, and that a Japanese syndicate will cooperate with the shipbuilding company in establishing a steamship line from Manzanillo to Japan.

It is further alleged that Krum Heller is charged with the mission of obtaining President Carranza's assistance in influencing Central and South American countries to permit the free entry of German immigrants to those countries and to secure more liberal terms from the Mexican Government for German colonists in Mexico.

JAPANESE SEAPLANE ACCIDENT.

Source: Reliable.

18 March 1920.

(5797.)

On the morning of 27 February, a seaplane which was flying over Tokyo Bay suddenly caught fire, and Lieut. Shimoyama, who was piloting the machine, hurriedly came down to the surface of the

water. The machine was totally wrecked soon after it reached the water by an explosion of the gasoline tank, but the aviator and another naval officer who was with him had time to dive into the sea and escape. This is the first such experience in the history of naval aviation in Japan, and the authorities are said to be making careful investigation into the causes of the mishap.

ITALIAN AVIATION AND THE MEDITERRANEAN.

Source: Reliable.

19 March 1920.

(4994.)

A member of the Italian Navy general staff, in an article on the above subject, makes the following points:

Italy should take advantage of the fact that her unique position makes her the first nation of the Mediterranean. Italy should be the first to establish aerial communication with various parts of the Mediterranean before this is done by other nations. Italy should have express service with Asia Minor, Syria, eastern Mediterranean coasts, and Africa, together with spheres of influence in Asia Minor for its control and protection.

The following types of sea planes are required:

(*a*) Dual control.

(*b*) Able to float in rough seas.

(*c*) Equipped with a perfect wireless-telegraphy apparatus, which can operate even in cases of forced landing.

(*d*) A radius of action covering four hours' flight.

(*e*) A commercial velocity of 150 kilometers per hour.

(*f*) Able to carry a good quantity of postal matter or a fair number of passengers.

By air to Constantinople in less than 8½ hours (in 4 stages, 10 hours).

To Beirut, the commercial and political center of Syria, in 12 hours (6 stages).

ITALIAN COLONIAL AVIATION.

Source: Reliable.

22 March 1920.

(4994.)

An Italian aviation commission has been sent to the Italian Somaliland and Eritrea. Twenty planes have been shipped there for mail and commercial service. An aviation school will also be established there. In Lybia there are nine squadrons. Seven land and two seaplane squadrons.

A nonstop flight was recently made by a Sva from Tripoli to Bengasi (580 miles), in 4½ hours.

OPERATIONS.

THE OPERATIONS OF THE UNITED STATES NAVAL FORCES OPERATING IN NEAR EASTERN WATERS.

Source: Reliable.

20 February 1920.

This command comprises all near eastern waters east of 21° east longitude.

The duties of the senior United States naval officer, Turkey, are:

(*a*) Commanding United States naval forces Near East.

(*b*) United States high commissioner to Turkey.

(*c*) Senior United States representative in the Near East, under which are:

1. The United States commissioner's office at Constantinople.
2. Coordination of various American interests and organizations in the Near East.
3. The United States consulate at Constantinople.
4. General direction of all United States consular officials in Turkey.
5. Representative of the United States Shipping Board in the Near East.
6. Chairman of Constantinople chapter of the American Red Cross.
7. General assistance to the Near East relief committee and relief organizations.

The flag of the senior United States naval officer, Turkey, was hoisted on the U. S. S. *Scorpion*, station ship at Constantinople, and later transferred to U. S. S. *Galveston* upon her arrival in July, 1919, when she was made station ship. Neither ship is suitable for flagship, station ship, and storehouse. Offices had to be established ashore for the work in hand, the flag being flown on the ship acting as station ship.

The offices of the senior United States naval officer, Turkey, are located in the American embassy. This office contains the following officers and necessary men: Operations officer, flag secretary, flag lieutenant, communications, intelligence service. Operations of force, policy of ship movements, general fuel situation, with future needs, are handled by operations officer. This same officer is United States representative on the advisory committee of the associated

Governments for the regulation of trade in Turkey, and also assistant to the senior United States naval officer, Turkey, for Shipping Board and merchant affairs. He is senior aid on the staff. The flag secretary has charge of all general secretarial work both for naval and for high commissioner duties. He has charge of officer personnel and general supervision of the communication clerical record and distribution, as well as Navy personnel, in all offices at the embassy.

The flag lieutenant has charge of transportation by automobiles, rail, steamer, or other means; in charge of all communication, transmission, and receiving system; has charge of Government automobiles; general flag lieutenant duties.

The communication office, as its name implies, handles all outgoing and incoming communication work. The communication officer, with his commissioned and enlisted personnel, handles all official work, and also all Red Cross, Near East relief, Food Administration, and commercial work. Military occupation of the country has necessitated that messages be given an official stamp to "get through." Commercial work was practically stopped until this office began handling it.

The intelligence service is self-explanatory. Its principal and most important work is that of watching, reporting, and following the political doings of our allies as well as those of the various other nations in the Near East. The Russian situation also demands the attention of this service, owing to the necessity of forever watching the trend of bolshevism with regard to its effect on the political and the economic conditions of this whole country.

In order to properly handle supplies and provisions as well as pay accounts, a supply office was established ashore. This office maintains provisions, clothing, N. S. A. stores and canteen supplies for the force. All supply officer work for ships without such officers is done by this office. For destroyers, subchasers, eagle boats, and ships without supply officers, this office maintains a canteen, clothing, and small-store issue room. Public bills, fuel bills, fresh provision contracts, purchasing of foreign currency, and such are handled by this office.

The station ship handles actual ship operations, berthing, the upkeep of the station boats, radio traffic, the enlisted personnel, all ship repairs and docking, and, in general, is practically a tender to the other ships.

The United States naval port officer, who is the commanding officer of the U. S. S. *Scorpion*, is the United States representative at the meetings of the allied port officers; he is present in an advisory capacity and keeps the senior United States naval officer, Turkey, in-

formed of the policy, orders, and desires of the allied port officials that our Navy may cooperate with them, since we are not a party to the armistice with Turkey. In connection with the port office is an officer known as naval transport officer. This officer is in charge of boarding United States merchant ships, arranging their clearance, berthing, aiding them in every possible way toward expediting, loading, and unloading in conjunction with agents; he follows up the work of the various agents and, under guidance of the senior United States naval officer, Turkey, does all possible to aid American shipping and American merchants in obtaining a fair deal in the Near East where graft, profiteering, discrimination, and every known hindrance to trade is allowed to flourish unchecked.

The staff medical officer attends all meetings of the Interallied Sanitary Commission in an advisory capacity and cooperates with this commission in every way possible. The dental surgeon has a place set aside for him for his work; but owing to the small amount of time spent in this port by the destroyers, the dental surgeon, with his portable outfit, makes trips on them, thus performing a great deal of his work afloat.

The operations of the naval forces are most varied and unusual. They are a long line of hard service performed under trying conditions calling for all the duties of diplomats, naval men, relief ships, passenger carrying, inteligence service and at the same time showing our flag where it has seldom been seen before. Beginning with three yachts (*Scorpion*, *Nahma*, and *Noma*) in Turkish waters and six subchasers on Red Cross relief in Grecian waters, the force has had the *Tonopah*, *Arizona*, *Olympia*, and the destroyers *Manley*, *Luce*, *Gregory*, *Stribling*, *Dyer*, *Barney*, *Chew*, *Hazelwood*, *McLanahan*, *Roper*, *Ellis*, *Laub*, *Dupont*, *Tattnall*, *Cole*, and *Biddle* within the past year. The present force consists of the *Galveston*, *Scorpion*, *Eagle No. 1*, subchasers *96*, *338*, the destroyers *Dupont*, *Tattnall*, *Cole*, and *Biddle*. The subchasers have just arrived. The Eagle boat lost her propeller and tail shaft and has been useless. The *Galveston* is acting as flagship and station ship, and the *Scorpion* is being used for general service and at present caring for service to Russian refugees at Proti Island. By far, the bulk of Navy operations has been done by the destroyers. The four now on the station have been here since the 1st of August and have covered practically the whole station with an average steaming of 23,000 miles from August 1 to date. Their duties have been as follows: Radio traffic ship at Salonica, Greece, to maintain communication by radio with force commander; radio traffic ship at Batum to keep open communication with the mission of Col. Haskell, United States Army, allied high commissioner to Armenia; carrying members of the Near East relief to various ports, also stores for the same organization, thus

aiding in every way their great humanitarian work; meeting and convoying the U. S. S. *Arizona*, U. S. S. *Martha Washington*, and U. S. S. *Olympia* through mined areas; accompanied the *Olympia* on her cruise of investigation to the north coast of Asia Minor; transported the American section of the Allied Commission on Mandates in Turkey (Crane-King mission) to Smyrna, Beirut, and return; transported this mission to Venice, Italy; transported members of mission headed by Gen. James G. Harbord, United States Army, and assisted this mission; investigated fuel situation (for coal, oil, and water) at all major ports in command as requested by Bureau of Supplies and Accounts through Office Naval Intelligence; maintained mail and dispatch service with Smyrna during session of allied investigation committee; transported mission to South Russia; cared for and aided mission of Rear Admiral Newton A. McCully, United States Navy, to Russia; aided in the withdrawal of Americans, noncombatants, sick, and wounded from ports of south Russia threatened and taken by Bolsheviks. It transports State Department representatives; maintains mail, dispatch, and passenger service to all ports in Black Sea due to unusual conditions and necessity of lending all possible aid to American officials, commercial men, relief, and Red Cross workers and Food Administration officials; it cruised to Beirut and near-by ports during threatened uprisings by native population against French occupational forces; it exchanged visits with destroyers in the Adriatic; it transported allied high commissioner to Armenia to and from Batum, and maintains mail and courier service in Aegean Sea. During all this work officers and men have become well acquainted with a hitherto unknown part of the world for our Navy, have made valuable reports and investigations, and have proven themselves indispensable for the work in hand.

To keep the operations to as high a state of usefulness as possible has brought a great demand on communications, fuel, food, and repairing facilities. Almost immediately after arriving in Constantinople it was found that, with military control of communication lines in Turkey, Bulgaria, Roumania, and total paralysis of systems in Russia, our own lines for inside as well as outside dispatch work would have to be established. Two trans-Atlantic radio receiving sets were installed in a small room on the top floor of the American embassy and a continuous radio watch has been kept on these sets. All radio work from force commander via Carnarvon, Opnav, and commercial traffic from Annapolis radio station are received here direct and sent to the communication office for distribution. In addition, for outside news, press news is copied, which is mimeographed by the communication office—an average of seven pages a day. This news sheet was at first issued only to our own forces and

American officials, but as requests came for copies from every nationality, including American colleges, relief organizations, various naval and military forces, the present daily issue of the news sheet was increased to 150 copies. All outgoing dispatches were originally sent by eastern telegraph wire, while communication within the station was by radio, Turkish and allied military wires, and by requests on allied naval ships when we did not have sufficient power. We have discontinued using allied naval ships except in emergencies. A radio chain through a destroyer at Saloniki, United States forces in the Adriatic, and Vienna was established to get quicker and better service to London and then to the United States. At first, this chain ran through a destroyer at Spalato and then to Vienna for London; a receiving station at Vienna is now working, to which we send directly from Saloniki. To communicate in the Black Sea, a destroyer is kept at Batum; at other ports, in case we have no naval vessel there, American merchant ships are used. Cables are used only when no other means are available, as they are so overloaded that messages are not safeguarded and information thus leaks out, especially regarding commercial matters. From Batum to Tiflis, an agreement has been made between an Italian radio station and ourselves for our destroyer to work with them. Only cables and land wires are available for Turkey in Asia and other parts of the command. But for the Navy communication office it is difficult to imagine what our Near East relief, Food Administration, Red Cross, and commercial men would have done. The latter were especially handicapped by military control of cable lines, no regular steamers, and almost total lack of mail facilities. We took it upon ourselves to look out for them because, first of all, they were American enterprises, and secondly, our prestige was invaluable in dealing with military control. Considering that competition was made one sided by allied control of cable lines and that all messages sent by our commercial men were the property of their foreign competitors for a small amount of "backsheesh," the saving of American trade came to a question of communications.

A regular system in code is now established to the district communication office, New York, for west bound traffic while east bound comes direct from Annapolis via radio. The Navy communication office is and has been for all United States interests of inestimable value and keeps these interests coordinated. The average monthly messages handled are 2,000 total incoming and outgoing.

The fuel situation has been—as in most of Europe—a trying one, at times even reaching the point of none to be had. The coal situation first found us dependent on the British colliers but this was discontinued and we had to resort to native coal. Some fuel was obtained from the Adriatic; recently a supply was received from the

U. S. S. *Nereus* sufficient to last for some months. While coal has never been absolutely lacking, our operations have depended on fuel oil-burning vessels and not on coal-burning ones. A very thorough investigation on this station found no Government contracts for supplying fuel. At first the force was solely dependent on the British Admiralty tankers for supplying our destroyers. They finally shut down on all nations but an agreement was eventually made to give us 700 tons per month chargeable against our war account. This lack of fuel oil in a district previously a heavy exporter of oil has been almost a calamity; the Roumanian fields can not possibly be producing before another six months, as the pipe lines and tankage are in a very bad condition; the Baku fields, while producing, are affected by a mass of circumstances which practically cut off fuel from them. Our destroyer requirements grew to where 700 tons from the British was insufficient; the force is using from 2,000 to 2,500 tons per month. Through the British oil controller in the Caucasus it was arranged to get some fuel oil over the Batum-Baku Railway in tank cars, the Standard Oil Co. agreeing to buy this oil and store it in their 4,000-ton capacity tank at Batum to be issued only on order from senior United States naval officer, Turkey. This supply was a joint one to be drawn on by the British and the American Navies only. So far, it has been managed to keep a small stock on hand—the daily receipts never exceeding 100 tons a day with the everpresent probability of stopping altogether. Conditions are now such that it was necessary to get permission from the department to use railway fuel in case of emergency; the British tankage supply is being sorely pressed to meet their needs and the force was cut off for a week necessitating oiling one destroyer from an American ship; also, using the disabled Eagle boat to hold about 30,000 gallons as a reserve for another such emergency. In addition, merchant vessels have had their fuel troubles, which have been remedied by dividing ships' supplies, issuing from our meager stock at Batum, etc.

With all the operations, it has been managed to dock two destroyers for cleaning and painting and expect to dock the other two as soon as they can be spared for three or four days. Norfolk-brand bottom paints were ordered from the United States before any docking was done—sufficient being obtained to dock each ship on the station once. One destroyer had a propeller removed and a new one installed. Many minor repairs have been performed by the station ship and shore establishments.

Besides the work performed by the Navy with naval ships, there have been 50 ships with a total of about 300,000 tons of food and other relief cargoes for distribution in Turkey, Bulgaria, Roumania and Caucasian relief (to Armenians principally). The near

eastern naval forces, operating in conjunction with the United States Food Administration and the American Committee for Relief in the Near East, have arranged bunkers, communications, repairs, aided in obtaining warehouses, docks, handling of cargoes and, in many cases, took complete charge not only of the ship but everything connected with her. As Shipping Board representative, the senior United States naval officer, Turkey, and his naval assistants, look out for these ships while other privately owned merchant vessels continually fall back on the Navy to help them in some way. At this writing, there are 25 American merchant ships within this station's limits. In all dealings with merchants and their ships, the underlying idea is fairness, honesty, and cooperation by Americans. With a naval officer representing us on the associated Government's advisory trade committee there is another example of the Navy fighting for just competition and fairness in the dealings among foreign merchants and our own. One can not picture the local conditions—probably no such conditions exist elsewhere in the world with so many aparently unsurmountable barriers. The flag office at the embassy and our transport office have saved many hours of inconvenience and have sent many an American on his journey wondering why everyone says "It is almost impossible to get a passport visé or a room here or a passage on some steamer." The above two offices, arranging accommodations for any American requesting such, will see that he or she is properly looked out for in the Interallied Passport Bureau, send dispatches for them—in fact, they represent directly the spirit of the Near East forces; namely, look out for and give all possible help to Americans. There is also always some opportunity of showing our interest in the American colleges and in the Y. W. C. A. and the Y. M. C. A. workers who have headquarters in Constantinople, likewise our American Red Cross.

So far only the activities of the Near East forces have been mentioned. There is also some time for play, but the diversions available are few and un-American. The Y. M. C. A. has a "sailors' club" with two very energetic girl secretaries who accomplish a great deal. The great need is for a band with nothing but home music and a ship suitable for having motion-picture shows for "all hands" in port. This would be especially good for the "get together" result of ships' crews (officers also); the men could have good music for dances on shore; we now have a small volunteer stringed orchestra which helps. Recreation grounds are practically nonexistent. The destroyers get plenty of sight-seeing and, in fact, few stations offer such a variety of attractions in the way of cities and ports visited with so much historical interest attached, Athens, Smyrna, Constantinople, Batum, Beirut, Port Said, Alexandria, Cairo, Rhodes, Saloniki, Constanza, Varna, Odessa, Sebastopol, Jaffa, and many other

ports, besides those visited on exchange visits to the Adriatic, give an idea of what there is to see. Men from the station ship are sent to destroyers, for trips, to give them an opportunity to visit also.

Besides his naval duties, the senior naval officer, Turkey, was, in early August, 1919, commissioned by the President of the United States, high commissioner of the United States of America for Turkey. Previous to this the senior United States naval officer had been acting as the senior United States representative and was performing the same duties that then devolved upon him with the new title. One can hardly appreciate, without having been on the station, the favorable change of attitude of the foreign representatives when this new title was conferred upon the senior United States naval officer, Turkey. The high commissioner, as the direct and the senior United States representative in the Near East, has under his jurisdiction and guidance all officials of other governmental departments as well as all Americans and American enterprises. With the dual position, the offices of the high commission are located in the United States embassy building, thus carrying on, jointly, the Navy and State Department work. Except for strictly naval business, correspondence originates as from the United States high commissioner—the title senior United States naval officer, Turkey, being used for issuing orders to ships, officers, for ordering court-martial, boards, and such. For filing records, two files are maintained, one known as the Navy file and the other as the high commission or State Department file; the former is a complete record of all naval correspondence, high commission work, and papers during the time from the beginning of this station while the senior United States naval officer was acting as senior United States representative; while the latter contains all that pertains to the State Department. In this way, withdrawal of the Navy would leave the embassy files complete. One of the most important parts of this arrangement has been to obtain coordination of effort by all concerned. All political correspondence and dispatches, anything as to matter of policy in the Near East are referred to the commissioner for information; such correspondence as he can properly handle is routed to him for action for the high commissioner; matters for consular action go to the commissioner and the consulate. Trade and commercial correspondence and all dispatches of such a nature are routed to the commissioner, consulate, and to the commercial attaché's office. The military attaché to the commission, the various consuls within the command, and others are kept informed of our policy, actions, plans, instructions, and the like and are required to reciprocate the above for the information of the high commissioner.

The underlying principle is and has been to give to all the various officials as much information and help as possible; distribute the

work amongst the various suboffices and to obtain coordination and cooperation to the highest degree attainable in furthering our cause for America and Americans. That results speak for themselves and that harmony of effort exists is better shown when one sees naval officers of the staff and an embassy secretary side by side in the same office; where on the advisory trade committee of the associated Governments one finds a naval officer as United States representative and an American vice consul as permanent secretary; with high commissioner and the commissioner as chairman and secretary, respectively, of the Red Cross chapter in Constantinople; where the flag lieutenant handles transportation and communications for both State and Navy Departments and aids in every way possible diplomatic couriers. In addition to the inside, outside cooperation is equally fostered. The embassy is, as one would wish it, a meeting place for Americans—officials, business men, shipping men, missionaries, relief workers, Red Cross, naval and military personnel, citizens—who come to talk, discuss, propose, plan, cooperate, and where we are ever ready and glad to help, one and all, for America and hers.

The American high commission replaces the American ambassador with the regular diplomatic and consular services, because diplomatic relations were broken with Turkey when we entered the war and will not be reestablished until peace is declared. Under these circumstances, while the Allies with whom we were associated in the war are maintaining an armistice in Turkey and a state of war exists, our commission must safeguard American interests and cultivate cordial relations with all concerned.

BARRAGE FIRING IN COAST DEFENSES AS PRACTICED BY THE GERMANS IN BELGIUM.

Source: Reliable.

15 March 1920.

(12919.)

The intensive use of smoke screens and of night attacks on coast defenses makes it necessary to consider barrage firing by coast batteries. This description of the German system of barrage is believed to be absolutely accurate.

It appears that this method of coast defense gradually became extremely important in the ideas of the Germans, as the use of smoke screens made it impossible in the majority of cases to use coast batteries in the conventional manner. A squadron advancing behind a thick smoke screen fights under conditions closely approximating night attacks; consequently, barrage firing becomes essential.

In 1918 the coast was divided in zones from 2 to 3 kilometers wide, within which an effort was made to produce an annihilating density of fire by three successive barrages parallel to the coast at 1,500, 2,500, and 3,500 meters. These barrages were called in the telephone communications Anna, Berta, and Cesar.

In 1917 zones perpendicular to the coast were numbered numerically, commencing at the west, and did not cover the entire coast. It was only in 1918 that the zones joined each other, and they are called by the following names:

Barrage of Nieuport Harbor.
Barrage of Westend Harbor.
Barrage of Raversijde Harbor.
Barrage of Ostend Harbor.
Etc.

In addition, there was a barrage against landing parties, enfilading the coast and carried out by batteries of 88 mm. guns. The barrage fire would thus be opened up by command such as the following:

Barrage of Ostend, Anna.

All batteries from the 88 to the 380 mm. guns could be called upon to come into action and are included in barrage firing. As a general rule, explosive shell is used beyond 4,000 meters and shrapnel at shorter ranges. In particular the 380 mm. guns of battery Deutschland included in their missions barrage firing with shrapnel against the area opposite the entrance of the port of Ostend.

The zone of action designated for each piece is a function of its caliber. For instance, in the distribution of a barrage there will be one gun of 105 mm. every 100 meters, a gun of 150 mm. every 200 meters, and a gun of 280 mm. every 500 meters. Each gun then carries out a zone firing centered on its post of barrage with a bracket of 100 to 300 meters. This arrangement is very flexible. As a matter of fact, the coast commander has the possibility of crushing instantaneously, under a tremendous volume of fire, any point within 4,000 meters of the coast, as a result of a simple order. But the conditions that destruction fire really destroys the enemy, is that the enemy must be seen, and the smoke clouds prevent this, with the efficacy shown by the blocking of Zeebrugge and Ostend.

It is regretted very much that no trace was found of microphones, for it is not possible to carry on the discussion without taking this possible element into consideration. Nevertheless, it seems that battery Irene might have been designated for the special duty of firing in the area in which was located a microphone. As a matter of fact battery Irene had a barrage on a small circular zone called " West

Bell," which is the only one of its kind, and this "West Bell" is located in the Ostend Channel.

Each zone of the barrage is covered by five or six batteries, viz, about 20 pieces; but there are always available several batteries which can go into action in the neighboring zone.

The barrage of the "outer port of Ostend and of Zebrugge" are an exception to the above remark.

Every gun which can fire, and that is about 50 pieces, would be called on to overwhelm ships trying to force the entrance of the port. It is seen from the barrage data written on the gun shields that barrage firing could be carried out by battery up to the extreme limit of the range of these pieces, viz, battery Kaiserin takes part in barrages in front of the Dutch border (14,000 meters) and in front of Mispelburg (13,500 meters).

TRIALS OF H. M. S. HOOD.

Source: Reliable.

29 March 1920.

(12408.)

The following data, relative to the *Hood* trials, recently conducted, has been obtained:

(*a*) Full power trial at a displacement of 42,200 tons, 32.07 knots.

Mean horsepower	150,000
Mean revolutions per minute	206

The trials took place on the measured mile course off the Isle of Arran in deep water, wind force 6.

(*b*) The engines worked very satisfactorily and a power of between 145,000 and 150,000 was maintained for a period of seven hours.

(*c*) A speed of 25 knots was obtained on two-fifth power.

(*d*) Propulsive coefficient 53 to 55 per cent.

(*e*) With full fuel and all weights and stores on board a speed of 31.9 knots was obtained. The displacement at which this speed was obtained is 44,600 tons, i. e., about 3,000 tons over normal displacement.

(*f*) Fuel consumption "very satisfactory."

It was stated that the full-power trial, during which 32.07 knots were obtained, was at a displacement "considerably in excess of the normal load draft." This displacement, as noted above, was 42,200 tons.

It is expected that further data relative to these trials will be obtained, and this data will be forwarded as soon as received.

ALLIED MERCHANT SHIPPING SUNK OR DAMAGED BY ENEMY AIRCRAFT.

Source: Reliable.

10 April 1920.

Reports of the British Admiralty show that approximately 100,000 gross tons of allied merchant shipping were lost, damaged, or molested through the activities of enemy aircraft during the World War. Of this amount about 8,000 tons, or 8 per cent, were lost.

Based on the total amount of 10,530,776 tons of allied shipping lost through all enemy agencies, the losses due to enemy aircraft were very small, the 8,039 tons being but 0.08 per cent of the total amount.

At present no figures for the enemy shipping lost or damaged through the activities of allied aircraft are available.

LAUNCHING OF JAPANESE SUBMARINE NO. 24.

Source: Reliable.

18 March 1920.

(6452.)

No. 24, second-class submarine, constructed at the Mitsubishi Shipyard, Kobe, was launched on the 9th of March, at 9.50 a. m. Her tonnage is over 1,000 tons.

Construction began on 18 August, 1919.

After she is inspected in October she will be handed over to the naval authorities for use at the Yokosuka Naval Station.

BRITISH FLEET, OCT. 1, 1919.

BATTLESHIPS.

Modern.	Building.	Obsolete or reserve.
Royal Sovereign.		Colussus.
Royal Oak.		Hercules.
Revenge.		Neptune.
Resolution.		St. Vincent.
Ramilles.		Collingwood.
Canada.		Bellerophon.
Queen Elizabeth.		Temeraire.
Malaya.		Superb.
Valiant.		Dreadnaught.
Barham.		Lord Nelson.
Warspite.		Agamemnon.
Agincourt.		Swiftsure.
Erin.		Hibernia.
Iron Duke.		Africa.
Benbow.		Zealandia.
Emperor of India.		Hindustan.
Marlborough.		Dominion.
King George V.		Commonwealth.
Ajax.		Duncan.
Centurion.		Exmouth.
Orion.		Albermarle.
Conqueror.		Queen.
Thunderer.		Prince of Wales.
		Venerable.
		London.
		Implacable.
		Vengeance.
		Glory.
		Albion.
		Canopus.
		Illustrious.
		Caesar.
		Hannibal.
		Mars.
		Jupiter.
		Victorious.
		Victorious II.

BATTLE CRUISERS.

Renown.	Hood.	Inflexible.
Repulse.		Indomitable.
Tiger.		New Zealand.
Lion.		Australia.
Princess Royal.		

LIGHT CRUISERS.

Modern.	Building.	Obsolete or reserve.
Danae.	Frobisher.	Chester.
Dauntless.	Effingham.	Birkenhead.
Dragon.	Raleigh.	Boadicea.
Dunedin.	Durban.	Fearless.
Delhi.	Diomede.	Active.
Ceres.	Despatch.	Blonde.
Cardiff.	Euphrates.	Blanche.
Coventry.	Enterprise.	Bellona.
Curlew.	Emerald.	Sentinel.
Carlisle.		Skirmisher.
Curacoa.		Patrol.
Caledon.		Foresight.
Calypso.		Forward.
Caradoc.		Topaze.
Cairo.		Sapphire.
Capetown.		Diamond.
Calcutta.		Amethyst.
Colombo.		Challenger.
Centaur.		Highflyer.
Concord.		Hyacinth.
Cambrian.		Pelorus.
Canterbury.		Proserpine.
Constance.		Pioneer.
Castor.		Psyche.
Champion.		Talbot.
Calliope.		Isis.
Caroline.		Dido.
Comus.		Diana.
Conquest.		Juno.
Carysfort.		Minerva.
Cardelia.		Venus.
Cleopatra.		Astraea.
Royalist.		Hermione.
Inconstant.		Fox.
Phaeton.		Sappho.
Aurora.		Philomel.
Galatea.		Rainbow.
Undaunted.		Encounter.
Penelope.		
Chatham.		
Birmingham.		
Southampton.		
Lowestoft.		
Dublin.		
Brisbane.		
Sydney.		
Melbourne.		
Hawkins.		
Weymouth.		
Yarmouth.		
Darmouth.		
Bristol.		
Newcastle.		
Liverpool.		
Gloucester.		
Glasgow.		
Attentive.		
Adventure.		

FLOTILLA LEADERS.

Modern.	Building.	Obsolete or reserve.
Campbell.	Keppel.	
Montrose.	Rooke.	
Stuart.		
Bruce.		
Douglas.		
Shakespeare.		
Spencer.		
Marksman.		
Anzac.		
Seymour.		
Saumarez.		
Parker.		
Grenville.		
Abdiel.		
Gabriel.		
Ithuriel.		
Nimrod.		
Kempenfelt.		
Lightfoot.		
Botha.		
Faulknor.		
Broke.		
Swift.		
Wallace.		
Saunders.		
Spragge.		
Mackay.		
Malcom.		

DESTROYERS.

290 subsequent to "L" class.	Wren.	20 "I" class.
19 "L" class.	Wye.	17 "H" class.
13 "K" class.	Vantage.	13 "G" class.
	Witch.	9 "F" class.
	Whitehall.	27 "E" class.
	Watson.	7 "D" class.
	Whelp.	27 "C" class.
	Wolverine.	18 "B" class.
	Worcester.	8 "A" class.
	Werewolf.	6 parramatta.
	Thracian.	
	Wrangler.	

SUBMARINES.

Modern.	Building.	Obsolete or reserve.
11 "R" type.	M–4.	3 "D" class.
3 "M" type.	L–21.	27 "C" class.
37 "L" type.	L–22.	2 "CC" class.
"L–55."	L–23.	
17 "K" type.	L–26.	
6 "J" type.	L–27.	
4 "V" type.	L–32.	
35 "H" type.	L–52.	
10 "G" type.	L–53.	
	L–54.	
	L–66.	
	L–69.	
	H–44.	
	50.	
	R–6.	

NOTES.—The *Courageous* and *Glorious*, while having the speed and guns of battle cruisers are not listed in this class as they were on special duty in the war and did not operate with the fleet. They can not be classed as obsolete, although it is doubtful that they will ever cruise with the fleet.

Battleships (modern): Those having 13.5-inch guns or greater. *Agincourt*, having 14–12-inch guns is included on account of being added to the fleet during the war.

Battle cruisers (modern): Combine 13.5-inch guns or larger with a speed of 28 knots or faster.

Light cruisers (modern): Combine 6-inch guns or larger with a speed of 28 knots or faster.

Flotilla leaders (modern): Combine a displacement of 1,600 tons or greater with a speed of 30 knots or faster

Destroyers (modern): To begin with "K" class, based on age.

Submarines (modern): To begin with "E" class, based on age.

JAPANESE FLEET

DESTROYERS, 1920.

(Built since 1909.)

Name.	Tonnage.	Speed.	Name.	Tonnage.	Speed.
Tokitsukaze(lost)	1,250	Unknown.	Yanagi	835	31.5
Tanikaze	1,300	34.0	Kashi	835	31.5
Amatsukaze	1,227	34.5	Hinoki	835	31.5
Isokaze	1,227	34.5	Sugi	655	30.0
Hamakaze	1,227	34.5	Kiri	655	30.0
Umikaze	1,150	33.4	Matsu	655	30.0
Yamakaze	1,150	33.4	Kashiua	655	30.0
Urukaze	955	29.0	Kusinoki	655	30.0
Nari	835	31.5	Ume	655	30.0
Kuwa	835	31.5	Sakaki	655	30.0
Tsubaki	835	31.5	Katsura	655	30.0
Maki	835	31.5	Kaba	655	30.0
Keyaki	835	31.5	Kaede	655	30.0
Enoki	835	31.5	Sakura	600	32.0
Momo	835	31.5	Tashibana	600	32.0

DESTROYERS, BUILDING OR AUTHORIZED, 1920.

Minekaze	1,300	Unknown.	Shimakaze	1,300	Unknown.
Swaakaze	1,300	Unknown.	Nadakaze	1,300	Unknown.
Yakaze	1,300	Unknown.	Shiakaze	Unknown.	Unknown.
Hakaze	835	31.0	Susuki	Unknown.	Unknown.
Momi	835	31.0	Hiku	Unknown.	Unknown.
Kaya	835	31.0	Yakaze	Unknown.	Unknown.
Nashi	835	31.0	Tachikaze	Unknown.	Unknown.
Take	835	31.0	Hakaze	Unknown.	Unknown.
Kaki	835	31.0	Okikaze	Unknown.	Unknown.
Tsuga	835	39.0	Fuji	Unknown.	Unknown.
Nire	835	39.0	Aoi	Unknown.	Unknown.
Kuri	835	39.0	Hagi	Unknown.	Unknown.
Okikaze	1,300	Unknown.			

SUBMARINES, 1920.

10	276	12.75	18	400	Unknown.
11	276	12.75	19	400	Unknown.
12	276	12.75	20	400	Unknown.
13	278	9.00	21	400	Unknown.
14	450	Unknown.	22	450	Unknown.
15	450	17.00	23	450	Unknown.
16	300	13.00	24	450	Unknown.
17	300	13.00			

SUBMARINES, BUILDING OR AUTHORIZED.

25	450	Unknown.	35	800	Unknown.
26	450	Unknown.	36	800	Unknown.
27	Unknown.	Unknown.	37	800	Unknown.
28	Unknown.	Unknown.	38	800	Unknown.
29	Unknown.	Unknown.	39	800	Unknown.
30	Unknown.	Unknown.	40	800	Unknown.
31	Unknown.	Unknown.	41	800	Unknown.
32	Unknown.	Unknown.	42	800	Unknown.
33	Unknown.	Unknown.	43	800	Unknown.
34	800	Unknown.			

CAPITAL SHIPS, 1920.

(Built since 1909.)

Name and year.	Type.	Normal displacement.	Speed.	Main battery.	Secondary battery.	Weight in pounds 1 complete discharge all guns of main battery.	Weight in pounds 1 complete discharge all guns secondary battery.	Total weight in pounds 1 complete discharge all guns.
1911—Seettsu [1]	Battleship	20,800	20.5	12 12-inch, 45 cal.	10 6-inch, 50 cal.	10,440	1,000	11,440
Kawachi [1]								
1912—Hi-Yei	Battle cruiser	27,500	27.5	8 14-inch, 45 cal.	16 6-inch, 50 cal.	11,200	1,600	12,800
Kongo	do	27,500	27.5	do	do	11,300	1,600	12,800
1913—Yamashiro	Battle ship	30,600	22.5	12 14-inch, 45 cal.	16 6-inch, 50 cal.	16,800	1,600	18,400
Haruna	Battle cruiser	27,500	27.5	8 14-inch, 45 cal.	do	11,200	1,600	12,800
Kirishima	do	27,500	27.5	do	do	11,200	1,600	12,800
1914—Fuso	Battleship	30,600	22	12 14-inch, 45 cal.	do	16,800	1,600	18,400
1916—Ise	do	31,260	23	do	20 5.5-inch	16,800	2,000	18,800
1917—Hyuga	do	31,260	23	do	do	16,800	2,000	18,800
1919—Nagato	do	33,800	23	8 16-inch	22 5.7-inch	16,800	2,200	19,000
1920—Mutsu	do	33,800	23	do	do	16,800	2,200	19,000

NOT YET LAUNCHED.[2]

(Date of authorization, 1918.)

Kaga	Battleship	33,800	23	8 16-inch	22 5.7-inch	16,800	2,200	19,000
Tosa	do	33,800	23	do	do	16,800	2,200	19,000
Amagi, Akagi, Atago, Ataki	Battle cruiser	[3] 40,000						

[1] Same as Seettsu, lost July, 1918.
[2] In addition to those named there are four more battleships, and four more battle cruisers, names and details unknown.
[3] No other details known.
NOTE.—Battleships now available which were built since 1909, 7; battleships authorized, 6; battle cruisers which were built since 1909, 4; battle cruisers authorized, 8.

FRENCH FLEET.

DESTROYERS LAUNCHED, 1909–1920, INCLUSIVE, AND NOW AVAILABLE.

Name.	Displacement.	Speed.
1909.		
Chasseur	485	30.4
Mameluck	400	30.4
Voltigeur	584	31.3
Poignard	417	28.0
Lansquenet	533	28.9
1910.		
Janissaire	504	28.6
Cavalier	517	31.2
Casque	807	34.9
1911.		
Cimiterre	876	31.2
Enseigne Henry	468	28.3
Bouclier	777	35.3
Opiniatre	950	32.0
Aventurier	950	32.0
Intrepid	950	32.0
Temeraire	950	32.0
1912.		
Dehorter	755	29.3
Captain Mehl	755	31.0
Aspirant Huber	755	28.3
Commandant Bory	750	31.0
Commandant Riviere	755	32.3
Bisson	755	31.0
Francis Garner	733	31.0
1913.		
Magon	825	33.2
Mangini	787	30.0
Protet	755	31.0
1914.		
Commandant Lucas	755	31.0
1915.		
Mecanicien Principal Lestin	880	30.0
Enseigne Roux	880	30.0
1917.		
Tonkinois	675	30.0
Marocain	675	30.0
Hova	675	30.0
Arabe	675	30.0
Algerien	675	30.0
Touareg	675	30.0
Somali	675	30.0
Senegalais	675	30.0
Sakalave	675	30.0
Kabyle	675	30.0
Bambara	675	30.0
Annamite	675	30.0

DESTROYERS AUTHORIZED IN 1913.

Ensigne Gaboldi [1]	890	31.0

SUBMARINES LAUNCHED, 1909–1920, INCLUSIVE, AND NOW AVAILABLE.

(Figures in italic denote speed and displacement on the surface and in roman while submerged.)

1909.			**1909.**		
Berthelot	*402*	*12.0*	Fructidor	*397*	*12.0*
	456	8.0		496	8.0
Curic	*390*	*12.5*	Ampere	*392*	*12.0*
	496	10.5		496	8.0
Watt	*402*	*12.0*			
	496	8.0			
Thermidor	*390*	*13.4*	**1910.**		
	496	8.0			
Archimede	*570*	*15.0*	Giffard	*402*	*12.0*
	797	10.0		496	8.0
Cugnot	*402*	*12.0*	Gay Lussac	*392*	*12.0*
	496	8.0		496	8.0

[1] This ship has not been launched.

SUBMARINES LAUNCHED, 1909-1920, INCLUSIVE, AND NOW AVAILABLE—Continued.

Name.	Displacement.	Speed.
1911.		
Brumaire	*390*	*12.5*
	496	8.0
Farraday	*390*	*12.5*
	496	8.0
Frimaire	*390*	*12.5*
	496	8.0
Volta	*390*	*12.5*
	496	8.0
1912.		
Amiral Bourgois	*546*	*15.0*
	720	10.0
Nivose	*390*	*12.5*
	496	8.0
Montgolfier	*390*	*12.5*
	496	8.0
Newton	*390*	*12.5*
	496	8.0
Coulomb	*390*	*12.5*
	496	10.5
Arago	*390*	*12.5*
	496	10.5
Euler	*390*	*12.5*
	496	8.0
Le Verrier	*390*	*12.5*
	496	10.5
1913.		
Franklin	*390*	*12.5*
	496	8.0
Gustave Zede	*846*	*17.5*
	1,181	10.3
Roland Mortilot	*252*	*8.6*
	290	5.8
Clorinde	*413*	*13.5*
	557	8.0
Cornelie	*413*	*13.5*
	557	8.0
Amaranthe	*413*	*13.5*
	557	8.0
Astree	*413*	*13.5*
	557	8.0
1914.		
Nereide	*846*	*14.0*
	1,181	12.0
Amphritite	*413*	*13.5*
	557	8.0
1914.		
Artemis	*413*	*13.5*
	557	8.0
Arethuse	*413*	*13.5*
	557	8.0
Atalante	*413*	*13.5*
	557	8.0
Andromaque	*413*	*13.5*
	557	8.0
Bellone	*518*	*17.5*
	777	10.0
1915.		
Hermione	*518*	*17.5*
	777	10.0
Gorgone	*518*	*17.5*
	777	10.0
Dubuy de Lome	*820*	*19.0*
	1,000	11.0
Daphne	*720*	*15.0*
	950	11.0
Ariede	*450*	*17.0*
	670	10.0
1916.		
Antigone	*451*	*17.0*
	652	10.0
Amazone	*451*	*17.0*
	652	10.0
Sané	*820*	*19.0*
	1,000	11.0
1917.		
Lagrange	*827*	*17.0*
	1,289	11.0
Romazotti	*827*	*17.0*
	1,280	11.0
Q 109 Joessel [2]	*846*	*17.0*
	1,181	11.0
Q 110 Fulton [2]	*846*	*17.0*
	1,181	11.0
Q 111 Laplace [2]	*827*	*17.0*
	1,289	11.0
Q 113 Regnault [2]	*827*	*17.0*
	1,289	11.0

SUBMARINES AUTHORIZED IN 1917.[3]

Paul Chailly	*866*	*13.5*
	1,171	8.5
Pierre Callot	*861*	*13.5*
	1,211	8.5
O'Byrne	*335*	*14.0*
	502	8.0
L. Dupetit Thouars	*335*	*14.0*
	502	8.0
Henry Fournier	*335*	*14.0*
	502	8.0

[2] These vessels have been launched, but there is no record to date of their having been completed.
[3] These submarines have not been launched.

CAPITAL SHIPS LAUNCHED 1909 TO 1920, INCLUSIVE, AND SHIPS BUILDING OR AUTHORIZED 1920.[1]

Name.	Type.	Normal displacement.	Speed.	Main battery.	Secondary battery.	Weight in pounds of main broadside.	Weight in pounds of secondary broadside.	Total weight of broadside.
			Knots.					
1909—Danton[2]	Battleship	18,450	19.0	4 12-inch, 50 cal.; 12 9.4-inch, 50 cal.	16 12-pounder S. A.; 10 3-pounder S. A.	8,439	222	8,661
Merabeau	do	18,445	19.7	do	do	8,439	222	8,661
Diderot	do	18,561	19.9	do	do	8,439	222	8,661
Condorcet	do	18,587	19.7	do	do	8,439	222	8,661
Voltaire	do	18,457	20.6	do	do	8,439	222	8,661
1910—Vergniaud	do	18,457	19.7	do	do	8,439	222	8,661
1911—Courbet	do	23,095	20.8	12 12-inch	22 5.5 inch; 4 3-pounders	10,368	1,842	12,210
Jean Bart	do	23,095	22.0	do	do	10,368	1,842	12,210
1912—France	do	23,095	20.0	do	do	10,368	1,842	12,210
Paris	do		21.6	do	do	10,368	1,842	12,210
1913—Lorraine	do	23,177	20.0	10 13.4-inch	do	12,030	1,842	13,872
Bretagne	do	23,177	20.0	do	do	12,030	1,842	13,872
Province	do	23,177	20.0	do	do	12,030	1,842	13,872
1914—Normandie[3]	do	24,830	21.5	12 13.4-inch	24 5.5-inch; 4 3-pounders	14,436	1,997	16,433
Flandre[3]	do	24,830	21.5	do	do	14,436	1,997	16,433
Gascogne[3]	do	24,830	21.5	do	do	14,436	1,997	16,433
1915—Languedoc[3]	do	24,830	21.5	do	do	14,436	1,997	16,433
FIRST LINE SHIPS ARE PROJECTED, BUT NOT LAID DOWN.								
Lyon	Battleship	29,000	21.5	16 13.4-inch	24 5.5-inch	19,248	16,433	20,891
Lilie	do	29,000	21.5	do	do	19,248	16,433	20,891
Duquesne	do	29,000	21.5	do	do	19,248	16,433	20,891
Tourville	do	29,000	21.5	do	do	19,248	16,433	20,891

[1] No ships were launched after 1916.
[2] Sunk in war.
[3] Not completed. Of this class the Bearn was laid down in 1914, but was not launched.

ITALIAN FLEET.

CAPITAL SHIPS LAUNCHED 1909 TO 1920, INCLUSIVE, AND SHIPS BUILDING OR AUTHORIZED 1920.[1]

	Name.	Type.	Normal displacement.	Speed.	Main battery.	Secondary battery.	Weight in pounds of main broadside.	Weight in pounds of secondary broadside.	Total weight of broadside.
				Knots.					
1910	Dante Alighieri	Battleship	19,100	22.8	12 12-inch	20 4.7-inch, 12 14-pounders	10,368	1,206	11,574
1911	Giulio Cesare	do	22,023	22.0	13 12-inch	18 4.7-inch, 13 14-pounders	11,232	1,116	12,348
	Conte di Cavour	do	22,023	21.7	do	do	11,232	1,116	12,348
	Leonardo da Vinci [2]	do	22,023	22.0	do	do	11,232	1,116	12,348
1913	Andrea Dorea	do	22,562	21.5	do	16 6-inch, 13 14-pounders	11,232	1,910	13,142
	Duilio	do	22,562	22.0	do	do	11,232	1,910	13,142

BATTLESHIPS LAID DOWN BUT NOT LAUNCHED.

Caracciolo	Battleship	30,900	25.0	8 15-inch	16 6-inch, 20 4-inch	13,504	2,368	15,872
Cristoforo Colombo	do	30,900	25.0	do	do	13,504	2,368	15,872
Marcantonio Colonna	do	30,900	25.0	do	do	13,504	2,368	15,872
Francesco Morosini	do	30,900	25.0	do	do	13,504	2,368	15,872

[1] No Italian first-line ships launched since 1913.

[2] Lost in war.

FLOTILLA LEADERS LAUNCHED 1909–1920, INCLUSIVE, AND NOW AVAILABLE.

(No flotilla leaders were launched before 1914.)

Name.	Displacement.	Speed.	Name.	Displacement.	Speed.
1914.			1915.		
C. Mirabella	1,476	35	A. Riboty	1,476	35
A. Poerio	1,012	32	1916.		
G. Pepe	1,012	32	Nibbio	1,460	35
C. A. Racchia	1,476	35	Sparviero	1,460	38
			Aquila	1,460	33

FLOTILLA LEADERS BUILDING AND AUTHORIZED, 1920.

Leone	1,985	34	Leopardo	1,985	34
Tigre	1,985	34	Lince	1,985	34
Pantera	1,985	34	Falco	1,460	34

DESTROYERS LAUNCHED 1909–1920, INCLUSIVE, AND NOW AVAILABLE.

1909.			1914.		
Fuciliere	410	28.8	R. Pilo	758	32.0
Carabiniere	410	28.5	G. C. Abba	758	32.0
Alpino	410	28.5	A. Mosto	758	32.0
Corozziere	382	28.5	F. Nullo	758	32.0
			I. Nievo	758	32.0
			S. Schiaffino	758	32.0
1910.			P. Bronzetti	758	32.0
			Audace	1,085	34.5
Pontiere	410	28.5	1915.		
			G. Missori	758	32.0
1912.			1916.		
Indomito	676	30.0	Giovanni Acerbi	770	33.0
Ardito	676	33.4	Francesco Stocco	770	33.0
Ascaro	392	28.5	Guiseppe Sirtori	770	33.0
Ardente	676	33.4	1917.		
			Vincenzo Orsini	770	33.0
1913.			Guiseppe la Masa	770	33.0
			Angelo Bassini	770	33.0
Irrequito	676	35.8	Giacinto Carini	770	33.0
Impavido	676	30.0	Nicola Fabrizi	770	33.0
Animoso	689	35.0	Giacomo Medici	770	33.0
Insidioso	676	30.0	Guiseppe la Farina[1]	770	33.0

DESTROYERS BUILDING AND AUTHORIZED, 1920.

Agostini Bertani	770	33	Castelfidardo	900	33
Palestro	900	33	Calatafimi	900	33
Solferino	900	33	Monzambano	900	33
Confienza	900	33	S. Martino	900	33
Curtatone	900	33			

[1]Building.

SUBMARINES LAUNCHED 1909-1920, INCLUSIVE, AND NOW AVAILABLE.[2]

(Figures in italic denote speed and displacement on the surface, and in roman while submerged.)

Name.	Displacement.	Speed.
1911.		
Vellela	*249*	*13.00*
	295	8.50
1912.		
Argo	*249*	*13.00*
	295	8.50
Fisalia	*248*	*13.00*
	295	8.50
Atropo	*230*	*14.70*
	315	8.00
Salpa	*249*	*13.00*
	295	8.50
Jantina	*245*	*13.00*
	295	8.50
1913.		
Zoea	*242*	*13.00*
	295	8.50
Nautilus	*222*	*15.00*
	297	9.00
G. Ferraris	*344*	*15.00*
	397	9.00
P. Micca	*689*	*18.00*
	.....	10.00
Galvani	*689*	*18.00*
	.....	10.00
Toricelli	*689*	*18.00*
	.....	10.00
L. Marcello	*689*	*18.00*
	.....	10.00
Argonauta	*245*	*13.00*
	300	8.50
1914.		
S-1	*252*	*13.00*
	586	8.50
G. Pacinotti	*700*	*16.00*
	1,070	10.00
A. Barbarigo	*700*	*16.00*
	1,070	10.00
A. Provana	*700*	*16.00*
	1,070	10.00
S. Venerio	*700*	*16.00*
	1,070	10.00
G. Nani	*700*	*16.00*
	1,070	10.00
W-1	.....	*13.00*
	500	8.50
1915.		
W-2	.....	*13.00*
	500	8.50
S-2	*252*	*13.00*
	386	8.50

Name.	Displacement.	Speed.
1915.		
S-3	*252*	*13.00*
	386	8.50
W-3	.....	*13.00*
	.....	8.50
X-1	*179*	*7.00*
	202	5.00
A-1	*30*	.....
	.....	.....
A-2	*50*	.....
	.....	.....
A-3	*50*	.....
	.....	.....
A-4	*50*	.....
	.....	.....
1916.		
A-5	*50*	.....
	.....	.....
A-6	*50*	.....
	.....	.....
B-1	*40*	*7.00*
	46	5.00
B-2	*40*	*7.00*
	46	5.00
B-3	*40*	*7.00*
	46	5.00
F-1	*260*	*13.00*
	380	8.25
F-2	*260*	*13.00*
	380	8.25
H-1	*356*	*13.00*
	467	11.00
H-2	*356*	*13.00*
	467	11.00
X-2	*400*	*10.00*
	460	.....
X-3	*400*	*10.00*
	460	.....
N-1	*265*	*12.50*
	365	8.00
N-2	*265*	*12.50*
	365	8.00
N-3	*265*	*12.50*
	365	8.00
N-4	*265*	*12.50*
	365	8.00
F-3	*260*	*13.00*
	380	8.25
F-4	*260*	*13.00*
	380	8.25
F-5	*260*	*13.00*
	380	8.25
F-6	*260*	*13.00*
	380	8.25

[2] No submarines launched in 1909 or 1910.

SUBMARINES LAUNCHED 1909-1920, INCLUSIVE, AND NOW AVAILABLE - Continued.

Name.	Displacement.	Speed.	Name.	Displacement	Speed.
1916.			1916.		
F-7	*260*	*13.00*	F-19	*260*	*13.00*
	380	8.25		380	8.25
F-8	*260*	*13.00*	F-20	*260*	*13.00*
	380	8.25		380	8.25
F-9	*260*	*13.00*	F-21	*260*	*13.00*
	380	8.25		380	8.25
F-10	*260*	*13.00*			
	380	8.25	1917.		
F-11	*260*	*13.00*			
	380	8.25	N-5	*265*	*12.50*
F-12	*260*	*13.00*		365	8.00
	380	8.25	H-3	*256*	*13.00*
F-13	*260*	*13.00*		467	11.00
	380	8.25	H-4	*356*	*13.00*
F-14	*260*	*13.00*		467	11.00
	380	8.25	H-5	*356*	*13.00*
F-15	*260*	*13.00*		467	11.00
	380	8.25	H-6	*356*	*13.00*
F-16	*260*	*13.00*		467	11.00
	380	8.25	H-7	*356*	*13.00*
F-17	*260*	*13.00*		467	11.00
	380	8.25	H-8	*356*	*13.00*
F-18	*260*	*13.00*		467	11.00
	380	8.25			

SUBMARINES BUILDING AND AUTHORIZED, 1920.[3]

N-6	*270*	*12.00*	B-5	*40*	*5.00*
	325	9.00		46	.....
L. Mocenigo	*689*	*18.00*	B-6	*40*	*5.00*
	.....	10.00		46	.....
A. FMO	*689*	*18.00*	1 boat	*394*	*13.00*
	.....	10.00		660	9.00
B-4	*40*	*5.00*	1 boat	*394*	*13.00*
	46	.....		660	9.00

[3] These submarines have not been launched.

UNITED STATES.

April 30, 1920.

Dates for completion of vessels.

BATTLESHIPS.

Vessel.	Location.	Date.
New Jersey [1]	Boston	Indefinite.
Virginia [1]	do	Do.
Connecticut	Philadelphia	May 15.
Louisiana [1]	do	Indefinite.
Michigan	do	May 15.
Minnesota	do	Do.
New Hampshire	do	Do.
South Carolina	Norfolk	Do.
Georgia [1]	Mare Island	Not set.
Nebraska [1]	do	Do.
Rhode Island [1]	do	Do.
Vermont [1]	do	Do.
Arkansas	Puget Sound	Apr. 30.
New York	do	May 15.
Texas	do	Indefinite.

CRUISERS AND GUNBOATS.

Des Moines	Portsmouth	May 15.
Huntington [1]	do	Indefinite.
Chester (reserve)	Boston	Do.
Frederick	Philadelphia	Do.
Pueblo [1]	do	Not set.
St. Louis	do	Do.
Wheeling	New Orleans	Indefinite.
Cleveland	Mare Island	May 30.
Denver	do	Indefinite.
Charleston	Puget Sound	Not set.
Montana	do	Do.
North Carolina	do	Do.
Seattle	do	Do.

DESTROYERS.

Bell (reduced commission)	Portsmouth	May 15.
Fairfax (reduced commission)	do	June 15.
Gridley (reduced commission)	do	June 1.
Israel (reserve)	do	June 15.
Lansdale (reserve)	do	June 1.
McKean (reduced commission)	do	May 15.
McKee (reduced commission)	do	July 1.
Stribling (reserve)	do	May 1.
Taylor (reduced commission)	do	Aug. 1.
Ausburne (fitting out)	Boston	Indefinite.
Converse (fitting out)	do	Do.
Conyngham (reduced commission)	do	Do.
Cowell (reserve)	do	Do.
Foote (reserve)	do	Do.
Kalk	do	Do.
Kimberly (reduced commission)	do	Do.
Luce (reserve)	do	Do.
Maddox (reserve)	do	Do.
Meredith (reserve)	do	Do.

[1] To be placed out of commission.

Dates for completion of vessels—Continued.

DESTROYERS—Continued.

Vessel.	Location.	Date.
Broome	New York	Indefinite.
Caldwell	do	Do.
Dyer (reduced commission)	do	Do.
Gregory (reduced commission)	do	Do.
McDougal (reduced commission)	do	Do.
Sampson (reduced commission)	do	Do.
Barker	Philadelphia	Ready.
Harding	do	May 1.
Hatfield (fitting out)	do	Ready.
Whipple (fitting out)	do	Indefinite.
Balch (reduced commission)	Norfolk	Do.
Benham (reduced commission)	do	Do.
Connor (reserve)	do	Do.
Downes (reduced commission)	do	Do.
Duncan (reduced commission)	do	Do.
Graham (fitting out)	do	Ready.
Manley (reserve)	do	Do.
Mason (fitting out)	do	Do.
Parker (reduced commission)	do	Indefinite.
Semmes (fitting out)	do	Ready.
Bush (reserve)	Charleston	Indefinite.
Osmund Ingram	do	Do.
Aaron Ward	Mare Island	Do.
Buchanan	do	Do.
Evans	do	Do.
Gillis	do	Do.
Kilty	do	Do.
Wickes	do	Do.
Dent (reserve)	Puget Sound	Do.
Dorsey (reserve)	do	Do.
Edwards (reserve)	do	Do.
Gwin (fitting out)	do	Do.
Rathburne (reserve)	do	Do.
Talbot (reserve)	do	Do.
Waters (reserve)	do	Do.

SUBMARINES AND SUBMARINE TENDERS.

O–3	Boston	Sept. 15.
O–5	do	Sept. 21.
Rainbow	do	July 24.
Savannah	do	Indefinite.
Beaver	Philadelphia	May 15.
L–1, 3, 9, 10	Norfolk	Indefinite.
O–9	Charleston	May 1.
L–6	Mare Island	Indefinite.

FLEET TENDERS (TRAIN).

Rappahannock (Reserve)	Portsmouth	July 15.
Mercy	New York	May 15.
Celtic	Mare Island	Indefinite.
Comfort (Ord.)	do	Do.

Dates for completion of vessels—Continued.

MINE FORCE.

Vessel.	Location.	Date.
IN COMMISSION.		
Baltimore	Mare Island	Indefinite.
IN RESERVE.		
Auk	Portsmouth	Indefinite.
Chewink	do	Do.
Curlew	do	Do.
Flamingo	do	Do.
Grebe	do	Do.
Osprey	do	Do.
Woodcock	do	Do.
Robin	New York	Do.
Kingfisher	Charleston	May 4.
Lapwing	do	Indefinite.
Penguin	do	May 12.
Sanderling	do	Indefinite.
Tanager	do	Do.
Turkey	do	Do.
Whippoorwill	do	Do.
Widgeon	do	Do.
Pidgeon	Mare Island	Do.
MISCELLANEOUS.		
Patapsco	Portsmouth	May 10.
Patuxent	do	Indefinite.
Nantucket	Boston	Do.
Aramis	New York	Do.
Kewaydin	do	June 1.
Nokomis	do	Indefinite.
Rintintin	do	June 1.
Tadousac	do	May 10.
Annapolis	Philadelphia	Indefinite.
Hannibal (Reserve)	do	Do.
Conestoga	Norfolk	Do.
Jupiter	do	Do.
Vicksburg	Puget Sound	Do.
Navajo	Pearl Harbor	Do.

NAVAL OVERSEAS TRANSPORTATION SERVICE.

Caesar	Norfolk	Indefinite.
Gulfport	do	June 26.
Mars	do	June 1.
Nero	Charleston	July 8.
Arethusa	New Orleans	Indefinite.
Pensacola	Mare Island	Do.
Bath	Puget Sound	Do.

UNITED STATES ARMY.

Gen. Schofield	Portsmouth	Indefinite.
Delaware	Philadelphia	Do.
Manhattan	do	Do.
Donovan	New Orleans	Do.
New Orleans	do	Do.
Taber	do	Do.

Dates for completion of vessels—Continued.

UNITED STATES SHIPPING BOARD.

Vessel.	Location.	Date.
George Washington	Boston	June 30.
Agamemmon	New York	Indefinite.
Moccasin	do	Do.
Lake Gedney	Philadelphia	Do.
Nockum	do	Do.
Mogunkook	New Orleans	Do.
Sequoia	Mare Island	Do.

PUBLIC HEALTH SERVICE.

James W. Wadsworth	New York	May 1.

PRIVATE PARTIES.

Cauchy	New Orleans	Indefinite.

PANAMA CANAL COMMISSION.

Favorite	New York	May 15.

Battleships out of commission, at Philadelphia.

Coast B. S. No. 1.[1]
Coast B. S. No. 2.[1]
Coast B. S. No. 4.[1]
Missouri.[1]

Battleships under reduced commission, at Philadelphia.

Alabama.[2]
Illinois.[2]
Kansas.[3]
Kearsarge.[2]
Kentucky.[2]
Louisiana.[2]
Maine.[2]
Wisconsin.[2]

Cruisers and gunboats out of commission.

Dubuque,[4] Portsmouth.
Paducah,[4] Portsmouth.
Ozark,[1] Philadelphia.
Tonopah,[1] Philadelphia.
Yankton,[5] Philadelphia.
Standish,[5] Norfolk.
Wasp,[5] Norfolk.
Winchester,[5] Norfolk.
Nashville,[1] Charleston.
Raleigh,[5] Charleston.
Tallahassee, Charleston.
Topeka, Charleston.
Monadnock,[5] Olongapo.
Castine,[5] New Orleans.
Cincinnati,[5] New Orleans.
Petrel,[5] New Orleans.
Wheeling, New Orleans.
Bay Ocean,[5] Mare Island.
Machias,[5] Mare Island.
Marblehead,[1] Mare Island.
Supply, Mare Island.
Yorktown,[5] Mare Island.

[1] No work being done.
[2] To be placed out of commission.
[3] Repairs completed.
[4] General repairs.
[5] To be sold.

Torpedo boats out of commission.

C.T.B. No. 1 (Foote),[6] Philadelphia.
C.T.B. No. 2 (Rodgers),[6] Philadelphia.
C.T.B. No. 3 (Dupont),[6] Philadelphia.
C.T.B. No. 4 (Dahlgren)[6], Philadelphia.
C.T.B. No. 6 (Morris),[1] Newport.
C.T.B. No. 9 (Somers),[6] Philadelphia.
C.T.B. No. 11 (Barney),[6] Philadelphia.
C.T.B. No. 12 (Biddle),[6] Philadelphia.
C.T.B. No. 14 (Delong),[6] Philadelphia.
C.T.B. No. 16 (Thornton),[6] Norfolk.

Eagle boats in ordinary at Portsmouth.

Eagle No. 2.
Eagle No. 3.
Eagle No. 9.
Eagle No. 13.
Eagle No. 18.
Eagle No. 19.
Eagle No. 23.[7]
Eagle No. 24.
Eagle No. 26.
Eagle No. 27.
Eagle No. 28.
Eagle No. 29.
Eagle No. 34.
Eagle No. 35.
Eagle No. 36.
Eagle No. 37.
Eagle No. 38.
Eagle No. 39.
Eagle No. 41.
Eagle No. 42.
Eagle No. 44.
Eagle No. 45.
Eagle No. 46.[7]
Eagle No. 47.
Eagle No. 48.
Eagle No. 50.
Eagle No. 51.
Eagle No. 52.
Eagle No. 54.[7]
Eagle No. 55.
Eagle No. 59.

Submarines out of commission.

U–117,[8] Philadelphia.
U–140,[8] Philadelphia.
UC–97,[8] Chicago.
UB–88,[8] San Pedro.
UB–148,[8] Philadelphia.
U–111,[8] Portsmouth.
C–1, 2, 3, 4, 5,[5] Coco Solo.
A–2, 4, 6, 7,[5] Cavite.
B–2,[5] Cavite.
G–1,[9] Philadelphia.

Submarines and submarine tenders in reserve.

D–1, 2, 3,[10] New London.
E–1, 2,[10] New London.
G–3,[10] New London.
O–11, 12, 13, 14, 15, 16, en route to Coco Solo.
F–2, 3,[10] San Pedro.
Rainbow, Boston.

Submarines in ordinary.

A–3, 5,[1] Cavite, P. I.
B–3,[1] Cavite, P. I.

Vessels to be placed out of commission in near future.

Warbler, Philadelphia.
Jupiter, Norfolk.
Elcano,[5] Asiatic Station.
Pampanga,[5] Asiatic Station.
Quiros,[5] Asiatic Station.
Samar,[5] Asiatic Station.
Villalobos,[5] Asiatic Station.
Isabel, Philadelphia.

Reduced commission or ordinary.

Rappahannock,[4] Portsmouth.
Chester,[4] Boston.
Cæsar,[4] Norfolk.
Hannibal,[4] Philadelphia.
Comfort,[4] Mare Island.

---

[1] No work being done.
[4] General repairs.
[5] To be sold.
[6] No work being done; to be sold.
[7] In full commission.
[8] Being dismantled.
[9] Target for depth charge experiments.
[10] Elemental submarine school work.

Destroyers out of commission, at Philadelphia.

Ammen.	Jenkins.	Perkins.
Beale.	Jouett.	Roe.
Burrows.	Mayrant.	Sterrett.
Drayton.	McCall.	Terry.
Fanning.	Monaghan.	Trippe.
Henley.	Patterson.	Walke.
Jarvis.	Paulding.	Warrington.

Old destroyers out of commission and being sold at Philadelphia.

Hopkins. Smith.

Summary, by navy yards, of ships under repair.

PORTSMOUTH, N. H.

1–Des Moines—May 15.
Huntington—Indefinite.
3–Bell (reduced commission)—May 15.
Fairfax (reduced commission)—June 15.
Gridley (reduced commission)—June 1.
Israel (reserve)—June 15.
Lansdale (reserve)—June 1.
3–McKean (reduced commission)—May 15.
McKee (reduced commission)—July 1.
Stribling (reserve)—May 1.
Taylor (reduced commission)—Aug. 1.
4–Rappahannock (reserve)—July 15.
Auk (reserve)—Indefinite.
Chewink (reserve)—Do.
Curlew (reserve)—Do.
Flamingo (reserve)—Do.
Grebe (reserve)—Do.
Osprey (reserve)—Do.
Woodcock (reserve)—Do.
2–Patapsco—May 10.
Patuxent—Indefinite.
Gen. Schofield—Do.

BOSTON.

New Jersey—Indefinite.
Virginia—Do.
Chester (reserve)—Do.
Ausburne (fitting out)—Do.
Converse (fitting out)—Do.

BOSTON—continued.

Conyngham (reduced commission)—Indefinite.
Cowell (reserve)—Do.
Foote (reserve)—Do.
Kalk—Do.
Kimberly (reduced commission)—Do.
Luce (reserve)—Do.
Maddox (reserve)—Do.
Meredith (reserve)—Do.
2 { O–3—Sept. 15.
O–5—Sept. 21.
3–Rainbow—July 24.
4–Savannah—Indefinite.
1–Nantucket—Do.
George Washington—June 30.
5–Destroyers fitting out.

NEW YORK.

2–Brome—Indefinite.
Caldwell—Do.
Dyer (reduced commission)—Do.
Gregory (reduced commission)—Do.
McDougal (reduced commission—Do.
Sampson (reduced commission)—Do.
3–Mercy—May 15.
Robin (reserve)—Indefinite.
Aramis—Do.
5–Kewaydin—June 1.
Nokomis—Indefinite.
6–Rintintin—June 1.
4–Tadousac—May 10.

Summary, by navy yards, of ships under repair—Continued.

NEW YORK—continued.

Agamemnon	Indefinite.
Moccasin	Do.
Jas. W. Wadsworth	May 1.
Favorite	May 15.
1–Newport [11]	

PHILADELPHIA.

1–Connecticut	May 15.
Louisiana	Indefinite.
1 Michigan	May 15.
1 Minnesota	Do.
1 New Hampshire	Do.
Frederick	Indefinite.
Pueblo	Not set.
St. Louis	Do.
Barker	Ready.
2–Harding	May 1.
Hatfield (fitting out)	Ready.
Whipple (fitting out)	Indefinite.
4–Beaver	May 15
3–Annapolis	Indefinite.
Hannibal (reserve)	Do.
Delaware	Do.
Manhattan	Do.
Lake Gedney	Do.
Nockum	Do.
5–Destroyers (fitting out)	

NORFOLK.

1–South Carolina	May 15.
Balch (reduced commission)	Indefinite.
Benham (reduced commission)	Do.
Connor (reserve)	Do.
Downes (reduced commission)	Do.
Duncan (reduced commission)	Do.
Graham (fitting out)	Ready.
Manley (reserve)	Do.
Mason (fitting out)	Do.
Parker (reduced commission)	Indefinite.
Semmes (fitting out)	Ready.
L–1, 3, 9, 10	Indefinite.
Conestoga	Do.

NORFOLK—continued.

2–Jupiter	Indefinite.
Cæsar	Do.
2–Gulfport	June 26.
3–Mars	June 1.
4–Alameda [11]	
5–Destroyers (fitting out)	
6–Other destroyers, submarines, eagle boats.	

CHARLESTON.

Bush (reserve)	Indefinite.
Osmund Ingram	Do.
1–O–9	May 1.
Kingfisher (reserve)	May 4.
Lapwing (reserve)	Indefinite.
Penguin (reserve)	May 12.
Sanderling (reserve)	Indefinite.
Tanager (reserve)	Do.
Turkey (reserve)	Do.
Whippoorwill	Do.
Widgeon (reserve)	Do.
2–Nero	July 8.
3–Ninette [11]	
3–Mine sweepers, Pacific Fleet	
4–Destroyers.	

NEW ORLEANS.

2–Wheeling	Indefinite.
1–Arethusa	Do.
Donovan	Do.
New Orleans	Do.
Taber	Do.
Mogunkook	Do.
Cauchy	Do.

MARE ISLAND.

Georgia	Not set.
Nebraska	Do.
Rhode Island	Do.
Vermont	Do.
2–Cleveland	May 30.
9–Denver	Indefinite.
Aaron Ward	Do.
7–Buchanan	Do.
Evans	Do.

[11] To be sent to this yard for work.

Summary, by navy yards, of ships under repair—Continued.

MARE ISLAND—continued.

6–Gillis (reserve)——Indefinite.
5–Kilty——Do.
7–Wickes——Do.
8–L–6——Do.
1–Celtic——Do.
Comport (ord)——Do.
8–Baltimore——Do.
Pidgeon (reserve)——Do.
1–Pensacola——Do.
Sequoia——Do.
3–Brutus [11]——
4–Newport News [11]——

PUGET SOUND.

1 { Arkansas——Apr. 30.
  { New York——May 15.
3–Texas——Indefinite.

PUGET SOUND—continued.

Charleston——Not set.
Montana——Do.
North Carolina——Do.
Seattle——Do.
Dent (reserve)——Indefinite.
Dorsey (reserve)——Do.
Edwards (reserve)——Do.
Gwin (fitting out)——Do.
Rathburne (reserve)——Do.
Talbot (reserve)——Do.
Waters (reserve)——Do.
4–Vicksburg——Do.
2–Bath——Do.
5–Destroyer Division 14.

PEARL HARBOR.

Navajo——Indefinite.

NOTE.—The number placed before the names of vessels indicates the order of priority.

[11] To be sent to this yard for work.

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FOR CONVENIENCE IN ROUTING.

Officer.	Initials.	Date received.	Date forwarded.
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Executive Officer			
First Lieutenant			
Navigating Officer			
Gunnery Officer			
Communication Officer			
Engineer Officer			
Medical Officer			
Supply Officer			
First Division Officer			
Second Division Officer			
Third Division Officer			
Fourth Division Officer			
Fifth Division Officer			
Marine Officer			

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MISCELLANEOUS.

A TRANSLATION OF THE TWO WHITE NATIONS WRITTEN BY LIEUT. COMMANDER VON HASE.

"Kiel Week 1914."

(The following is a free translation.)

On 22 May, 1914, the Times published the following item of news:

"VISIT TO THE BALTIC BY THE FIRST FLEET.

"The Admiralty states that four squadrons of battleships and cruisers will make a cruise in the Baltic next month. All important ports will be visited, including Kiel, Kronstadt, Copenhagen, Christiania, and Stockholm. These visits will be of the same character as those recently made by British squadrons to Austrian, Italian, and French ports, the visit now being made by an Austrian squadron to Malta, the visit made by a Russian squadron during the past summer to Portland, and the visit which will be made by a French squadron next month to the same harbor. Arrangements have been made by the governments concerned for the visits of the First Fleet, and as they have no political or international significance, it is to be hoped that they will be utilized solely for the customary exchange of friendly courtesies that are to be expected during such visits. These visits will be very welcome to officers and men, as they will be a change from the routine of the regular service in the home waters and will afford an opportunity for them to become familiar with foreign ports. The last time that British forces visited the Baltic was in the autumn of 1912, when the Second Cruiser Squadron visited Christiania, Copenhagen, Stockholm, Reval, and Libau.

"The Secretary of the Admiralty announces the following itinerary concerning the movements of the vessels of the First Fleet:

"The vice admiral of the second battleship squadron on board his flagship *King George V*, with the *Ajax*, *Audacious*, *Centurion*, and the commodore of the first small cruiser squadron on board the *Southampton*, with the *Birmingham*, and *Nottingham*, will visit Kiel from 23 June to 30 June."

The news of this intended visit to Kiel by the English fleet awakened the greatest interest in Germany and in the whole world. Some saw in it a significant step toward relieving the political tension, others saw only one more act of espionage before the unavoidable

clash. The German newspapers were full of this expected visit by the English fleet, and the navy made all kinds of preparations for the reception of the vessels at Kiel. Among other things, the Kaiser ordered that the two English commanding officers should have attached to them two German naval officers as their personal aides. In May I learned that I had been detailed as aide to one of the English admirals, and early in June it was announced in a fleet order that I had been detailed as personal aide to Vice Admiral Sir George Warrender and Lieut. Kehrhahn as personal aide to Commander Goodenough, the commanding officer of the small cruisers. During my tours of duty in foreign countries, especially in east Asia, as well as during a long stay in England, I had always enjoyed the best of relations with Englishmen, especially with English naval officers of my own age and rank. I had passed many pleasant hours in friendly intercourse with the English, and I was therefore very pleased when I learned of my orders, at the prospect of the social intercourse with English officers. I furthermore promised myself many incentives in the line of my profession.

Early Tuesday morning on 23 June, I, together with Capt. Henderson, the English naval attaché at Berlin and the navigation officer detailed as pilot for the English flagship, embarked in the motor launch which carried us out to the English squadron in the vicinity of Bulker Light Ship, about 10 miles out from Kiel. It was a dreary, rainy day, with only a light breeze stirring. At Bulker Light Ship we met the six motor launches of the navigating officers who were to bring in the other ships. Our small flotilla was just assembled when two black smoke clouds to the northward were sighted. The English ships were approaching in two columns. We quickly recognized the four battleships moving in line ahead in the left column, and in the right column, more to the rear, the three small cruisers. Viewed from our low position, the English battleships presented an imposing appearance. Their dark gray color appeared almost black against the lighter gray of the fog. Majestically these great vessels, the largest warships in the world, steamed toward us. They were the famous dreadnaughts, *King George V*, *Ajax*, *Audacious*, and *Centurion*, and the three small cruisiers, *Southampton*, *Birmingham* and *Nottingham*. On the flagship on which the English admiral's flag was flying, a signal was hoisted immediately upon making out our own hoist. The ships came to, the engines were reversed, and as the powerful vessels lost their headway, our seven motor launches went alongside the seven English ships. We went alongside the starboard sea ladder of the *King George V*, and from there climbed on board. The first officer of the ship, Commander Coldie, received us and conducted us to the admiral, who was standing on the admiral's bridge with his staff. Capt. Henderson presented us to the admiral. I wel-

comed him in the name of the Chief of the High Sea Fleet and the Chief of the Naval Station of the Baltic, and reported to him that I had been detailed as his personal aide during the visit of the English squadron at Kiel. The admiral appeared pleased and thanked me very cordially, and at once introduced me to the officers of his staff. They were Capt. Baird, flag captain (commanding officer of the flagship and at the same time chief of staff), the Hon. Arthur Stopford, flag commander (officer of the admiral's staff), and Flag Lieut. Buxton. Vice Admiral Sir George Warrender was a fine-looking man with an aristocratic countenance, clear blue eyes, and beardless face. He was probably about 55 years of age, was slightly gray, but his general appearance betokened youthful elasticity and cheerful goodwill. In my official report, which I turned in immediately after the visit of the British squadron, I made the following statement concerning the personal characteristics of the admiral and of the officers of his staff.

"Vice Admiral Sir George Warrender, Bart., is an agreeable man of the world of the true English type, with a confident and determined bearing. The officers of his staff and of his ships value his personal traits highly and he is said to be much loved in his squadron because of his characteristics and because of his personal interest in the welfare of his men."

While the vessels were entering the harbor and also later, I was impressed—as I have almost always been, with the English officers—by the short, businesslike manner of discharging all their duties. Not a superfluous word in their orders. This gives a very high impression of their service, in spite of the lack of almost all of our military formalities in address, speech, and demeanor. Warrender is somewhat deaf, but the officers of his staff are so well trained that he understands them even when they speak in an ordinary tone. In conversation with the other officers and with strangers, he had difficulty, especially during animated, general conversation at the table.

When I was alone with the admiral or when only the members of his staff were present, he asked all manner of questions about the German Navy and seemed particularly interested to learn about living and service conditions and the spirit of our officers and men. He also manifested a lively interest in our wireless telegraphy and in motors, especially our U-boat motors. Comparison between his own and our navy had become second nature with him and his officers. On various occasions Sir George Warrender proved himself to be an excellent speaker. He understands some German, but never uses it in speaking. Every day at his request, I had to translate for him the German letters received and the newspaper articles relating to his squadron.

Sir George Warrender is considered to be a good tennis player and a good golfer.

He always spoke of the Emperor and Prince Henry with the greatest respect. He was very much pleased at the reception accorded him and his wife by the Emperor and Prince Henry. He also took pains to be as courteous as possible to all German officers. With me, he was always very friendly and thoughtful. He frequently said how much he appreciated the fact that German officers had been attached to him and Commander Goodenough. As a matter of fact he demanded almost exactly the same service of me that he would of a personal adjutant. Speaking briefly, I might describe Sir George Warrender as an agreeable personality, with his officers and men well in hand, clear headed, full of interest for his profession and of current political conditions, and of almost youthful buoyancy.

Flag Capt. Baird, is chief of staff and commanding officer of the flagship. He is on his feet early and late. He manages all matters relating to officers and men for the whole squadron (entertainments, leave, athletics, etc.). Externally he gives an impression of exhaustion, but he is a clever, energetic officer.

Flag Commander, the Hon. Arthur Stopford. An officer of the admiral's staff, he is gunnery officer for the squadron. He is a clever man of a noble and friendly nature, with special sympathy for German home-life and manner of living.

Secretary Hewlett has a position of great responsibility. He ranks before the flag commander. His duties fully correspond to those of our secretary of squadron.

We entered Kiel Harbor on the morning of 23d June at about 9 o'clock. It amused me to be passing over this stretch of water which I had traveled so often in the past, on the admiral's bridge of an English flagship. Just off the Fords we passed into a thick rain squall, but the weather cleared as we pased Labo, and we beheld the beautiful harbor of Kiel in the gleaming sunshine. Numerous yachts and naval boats surrounded us, and the banks were crowded with the curious who had hastened hither to witness the entrance of the celebrated English dreadnoughts. From Labo on we were accompanied by the white motor launch of Prince Henry, who, with the ladies of his party greeted us. The admiral and Prince Henry exchanged greetings by a lively waving of caps. All the ships made fast almost simultaneously to the buoys assigned to them, in good order and with good seamanship. Soon after we assembled for breakfast in the admiral's mess. The admiral had at his disposal a very large dining room extending from one side of the ship to the other, and paneled in mahogany. He also had a saloon furnished very elegantly in light wood, and which, with its many cushions and light wall coverings resembled a lady's drawing

room. These two rooms were set apart for the general use of the members of the admiral's mess, but as a rule the latter spent most of their free time in their roomy cabins or in the officers' mess. For his personal use the admiral had in addition a roomy office, a large sleeping room and bath and lavatory.

We breakfasted very bountifully, and the admiral spoke to me during the meal concerning the program for the day which was as follows: At 11 o'clock, exchange of visits on board S. M. S. *Friedrich der Grosse.* Immediately after, presentation to Prince Henry. In the evening, dinner with Prince Henry. The admiral asked me where he could find me at any time he wished. I asked his permission to live on board the *King George V,* which was entirely satisfactory to him. He placed at my disposition, temporarily, the state cabins set apart for the ambassador, and my orderly, Seaman Hanel, placed all my belongings in these rooms. They constituted a complete apartment in themselves, consisting of a living room charmingly fitted up, a sleeping room, bath, and lavatory. Unfortunately, this good fortune did not last long, as on the very same evening the English ambassador came on board, and I moved into a cabin on a lower deck which was quite roomy but hot and uncomfortable. I lived on board the *King George V* during the whole of Kiel week, and even slept on board. Through being constantly with Admiral Warrender and his officers and guests, I had an opportunity to become well acquainted with them and to form a good estimate of the spirit that prevailed among them. In addition to the English ambassador, the latter's son and a nephew of the admiral, a young Lord Erskine, also lived on board as a guest of the admiral.

At the specified time we went in the admiral's barge, a very spacious steam launch beautifully finished in mahogany, to the fleet flagship, *Friedrich der Grosse,* where all the admirals and commanding officers of the fleet present in Kiel were assembled for an exchange of visits. Admiral von Ingenhol and Admiral Warrender made the necessary introductions. The German officers were cool and reserved in manner; the English were very much the same; so that in spite of a perfectly correct form, the political tension was noticeable. I did not notice this during subsequent festivities, especially in the intercourse of the younger officers, who very quickly became good friends. At all the balls and receptions on board ship and in the athletic sports the young English officers were always seen to be on the best of terms with the German officers and busily engaged in flirting with the German ladies. Moreover, the English officers frequently received invitations from our married officers, and spent many hours in German domestic circles. Both officers and men frequently availed themselves of the free railway transpor-

tation afforded them and hundreds visited Berlin and Hamburg every day. Owing to this, a large portion of the officers and men were always absent from Kiel.

From the *Friedrich der Grosse* we went to the imperial palace. We were received by Prince Henry, the princess, and the young princes and the court. Up to the very outbreak of the war both had always an especial preference for everything English and spoke English almost exclusively between themselves. I conversed for some time with young Prince Siegismund, and later also with the princess, who manifested great interest in my life on board the *King George V.* All the Englishmen were charmed with the affability and pleasant manner of Prince Henry.

From the palace we returned on board the *King George V,* where meanwhile the two naval attachés had reported as guests for lunch, Lieut. Commander Erich von Müller, who had come all the way from London, and Capt. Wilfred Henderson. Lieut. Commander von Müller at once drew me aside and said to me, "Be on your guard with these Englishmen. England is ready to strike; we are on the eve of war and the object of this visit is nothing more or less than spying. They want to get a clear idea of the readiness of our fleet. In particular, do not tell them anything about our U-boats." This statement coincided entirely with my own opinion, but I was astonished to hear it expressed so bluntly. I followed his advice strictly during the English visit. The future showed that Lieut. Commander von Müller was entirely right. How much better he perceived the danger threatening us, even before the Serajevo murder, than did his superior ambassador, Prince Lichnowsky.

We returned on board, and a few minutes later Prince Henry made his return visit, and the Chief of the High Sea Fleet and the Chief of the Baltic Naval Station soon followed him.

In the afternoon Flag Lieut. Buxton and I accompanied the admiral on his round of visits. First we went to the yacht club, where Warrender had an affectionate meeting with his friend, Rear Admiral Sarnow, with whom he had formed a friendship years ago in east Asia. We sat for a full hour over our champagne while the old gentlemen gained great pleasure in refreshing their memories with their reminiscences. We then drank tea with the Chief of the Naval Station of the Baltic, Admiral von Coerper, and afterwards accompanied the admiral and Frau von Coerper to the tennis tournament for the kaiser prize on the tennis courts in front of the Naval Academy.

When we returned on board, the English Ambassador, Sir Edward Goschen, had already taken possession of the sumptuous staterooms which I had used only for a noonday nap. During the following week I learned to know the English ambassador as an especially agreeable,

witty man, who treated us Germans with great courtesy. He is a descendant of the old Goschen family of Leipsig booksellers, and is, therefore, by descent, more German than English. After a little time spent with the ambassador, we all dressed for dinner with Prince Henry. Full dinner dress, that is to say, dinner coat with white vest and gold stripes on the trousers, was the prescribed uniform. A little before 8 o'clock we all proceeded to the royal palace in the comfortable barge in which we made so many trips during the coming week. The dinner passed off very smoothly. We dined in the white salon, at eight small tables. In addition to the higher English officers, the admirals present in Kiel, together with their ladies and a few members of the Holstein nobility, had been invited. An excellent orchestra accompanied the Lucullus-like repast, giving alternately selections from English and German composers.

Soon after 10 o'clock we again ordered the barge and returned to the *King George V.* Stopford and Buxton took me with them into the officer's mess, where I became acquainted with some of the officers of the ship. We lingered there together for quite a long time over our whisky and soda. On the English ships the officers nearly always have two large rooms at their disposal for social purposes; the true officers' mess, which is used almost exclusively as a dining room, and the smoking room, fitted up with arm chairs and leather sofas, where there is smoking, writing, and playing cards. The furniture is the property of the officers. On the *King George V* both of these rooms were fitted up with especial taste.

The following program was arranged for 24 June: At 10 a. m., call on the Secretary of State of the imperial navy office; at 1.30 p. m., arrival of his majesty on the yacht *Hohenzollern.* English flag officers and commanding officers to report on board the *Hohenzollern* (immediately after the latter anchors).

7.30 p. m., dinner with the English consul. Lieut. Kehrhahn, Buxton, and I accompanied Admiral Warrender and Commander Goodenough to the state secretary of the imperial navy offices, who had hoisted his flag on the S. M. S. *Friedrich Karl.* Grand Admiral von Tirpitz received us at the gangway and led us to his cabin. There he seated himself with the two English flag officers at a small table; we younger officers, with his adjutants, taking seats at another table. English was the only language spoken, the grand admiral speaking it very well. Warrender and Goodenough brought him greetings from his numerous friends and acquaintances in the English navy. Tirpitz then spoke of the development of our navy. Champagne was served. We remained about half an hour and then again boarded the *King George V,* where lively preparations were being made for the reception of the *Hohenzollern.* During the entire stay in Kiel, the crew had been engaged exclusively in cleaning-up service.

The ships, consequently, presented a very shipshape appearance. All damages to the paint during the voyage had now been removed, the decks holystoned, the railings for the parade stations of the crew had been marked off at equal distances by small chalk marks. At the appointed time the *Hohenzollern* passed through the Holtenauer Lock. This cruise marked the opening of the Kaiser-Wilhelm Canal to public service, and the work of widening the canal was thus completed. Only a little dredging work remained to be done to make it possible for dreadnaughts to use the canal, and this work was being pushed with all speed. On 30 July, 1914, the *Kaiserin* had passed through the canal as the first dreadnought, and the canal was therefore ready immediately before the outbreak of the war. Consequently Admiral von Ingenhol was able to detach the dreadnoughts to their home ports at Kiel and Wilhelmshaven upon our return from the Norwegian ports at the end of July, 1914.

When the order to station the fleet in the North Sea came, the Kiel dreadnoughts passed through the canal for the first time, but they had their coal bunkers emptied for this occasion. As the outbreak of the war occurred almost on the day that the improvements on the canal were completed, a war prophecy which I had made in 1911 was fulfilled. Being convinced that the mad competition in armament of almost all the great nations must inevitably lead to war, just as in earlier times the creation of a fleet was a prelude to battle, I prophesied at Hamburg in 1911 to certain merchants there that we would have war as soon as we possessed a high sea fleet consisting of two battleship squadrons, with the necessary accompanying battle cruisers, small cruisers and torpedo boats, as well as a large number of submarines, and as soon as our coast defenses (especially those on Helgoland) and the Kaiser Wilhelm Canal were ready. On August 1, 1914, all these assumptions were fulfilled with the completion of the canal; and the dance could now begin, according to my prophecy—and it began. One of the Hamburg merchants spoke to me later of the astounding accuracy of my prophecy. When I made this prophecy, however, I did not suppose that the preliminary conditions would be fulfilled before the spring of 1915.

When the *Hohenzollern* passed through the Holtenauer Lock on June 24, all the ships fired the imperial salute. A number of flying machines and a zeppelin airship circled about the *Hohenzollern*. Unfortunately one of the flying machines fell and its pilot, Lieut. Schroeter, was fatally injured. We passed the *Hohenzollern* at a rapid speed. The kaiser greeted us from the bridges of the *Hohenzollern*, where he saw Admiral Warrender standing. On the afterdeck of the English ship the red coated marines were stationed. The seamen were at parade at the ship's side. Each ship gave three hurrahs, during which the seamen accompanied each hurrah with a

wave of their caps. The marine band played the march of presentation. It was a magnificent sight and one which I shall never forget.

The presentation of the English officers was to take place immediately after the mooring of the *Hohenzollern*. We hastily donned gala uniform for this purpose and were ready to depart when the admiral again appeared on deck. The program had been communicated to the English commanding officers, but as yet not a commander was in sight. We saw everywhere the rowing gigs of the commanding officers lying alongside the gangway but not a boat moved. The admiral angrily ordered the signal "All commanding officers report on board the flagship" hoisted. Some little time passed before the signal was understood by all the ships. Everywhere the graceful but slow moving rowing gigs began to come forward. It developed later that the commanding officers had understood that they were not to come on board until a signal to that effect was hoisted. The admiral was very much annoyed, and I must confess that this lack of initiative on the part of the commanding officers seemed to me quite incomprehensible. Their fast ships' boats had not been used because the regulations prescribed that for official purposes the English officers could use only the rowing gigs. The barge quickly conveyed us to the *Hohenzollern*, where considerable excitement had arisen over the half hour's tardiness. The kaiser stood on the upper promenade deck and received the presentations there. He was animated and full of humor, as usual, and the English officers without exception showed their pleasure as long as the Emperor talked with them. All the officers expressed themselves as highly pleased on the return trip.

After lunch the admiral drove with Buxton and myself to the railway station to meet his wife. Lady Maude Warrender was a very large, fine looking woman of perhaps 40 years, the typical society woman. As we had learned from the English newspapers, she played an important part in the social affairs of London; she was known as an excellently trained singer. She lived on board the Hamburg American Line steamer *Victoria Louise*, which Ballin regularly sent to Kiel for Kiel week, and on board which the society people in Kiel were accustomed to meet evenings.

In the afternoon Prince Henry paid a visit to the *King George V* with his sons. Every moment of my leisure time was taken in drawing up a list for the invitations to the great reception on board the *King George V*, in which task I was assisted by the flag lieutenant of the High Sea Fleet and the adjutant of the station chief. In addition to this, I had constantly to furnish information to the English watch officers, the squadron secretary, the first officer of the *King George V*, and many others. I was also frequently called to the telephone which had been carried on board the flagship, and had

to furnish information to the German officers and authorities. These were busy days for me, in which no small part was played by the continuous visiting, the drinking of the finest of wines and the numerous cocktails and much whiskey and soda at all hours of the day and night.

On the evening of 24 June we assembled at the Hotel Seebadeanstadt to which the English Consul Sartori and his wife had been invited. I learned to know Commander Goodenough and the commanding officers better on this occasion. Goodenough, the commander of the cruiser squadron, who later during the war performed a distinguished service, especially impressed me. Admiral Jellicoe praised him in particular for his action in the Battle of the Skagerrak. At that time he as commander of the light scouting ships established touch with our main body and kept Jellicoe constantly informed of our movements. On this particular evening he showed himself to be an agreeable man of the world. I furthermore learned to know Capt. Dampier, the commander of the *Audacious*, as a witty entertainer. Among other things I learned an amusing toast which ran:

> I drink to myself and another,
> And may that one other be she (he)
> Who drinks to herself (himself) and another,
> And may that one other be me!

Most of the commanders had an overtaxed look. Many things may have contributed to this, as the life on board, the officers on board the vessels of the First Fleet lived a very different life from those on board vessels of our High Sea fleet. Details to vessels of the First Fleet are almost always for a period of two years. During this time the ships are almost continuously under way or lying in constantly changing harbors. Quarters on land are permitted the officers only in the rarest cases. Our ships, on the contrary, always return to their so-called home ports after their practice cruise, and then we officers live on shore with our families, and only one senior officer and two junior officers remain on board as watch officers during off duty periods. In this way we always had opportunity to recover from the wearing duties of life on board. The effects of this unsettled life of the English naval officers, with whom orders for foreign service of from two to three years is much more frequent than with us, is that the married officers have almost no real home, but have their families join them at the place where they are likely to spend the longest time with their ships. Their families then live in the boarding houses which are so numerous in England, or they live somewhere in England where the men of the family can visit them when opportunity offers. Owing to this constant life on board, the quarters allotted to officers on shipboard are much more spacious and homelike than with us. The rooms nearly always have a fire-

place, as no provision for steam heating is made on board the English ships. No room is without its big, comfortable leather chair. Moreover, the mahogany furniture of the rooms is almost always of the same design as was used in Nelson's time. After a two-year detail with the First Fleet, the entire crew of the ships is relieved—only a few of the specially important persons remain longer on board—and the entire crew then has a half year on land and receives an extended home leave during this time.

On June 25 the yacht races began, which had been preceded by the regatta of ship's boats. The usual athletic activities, the sight of which rejoices every seaman's heart, were going on in the roadstead. The start, however, lay too far away from the *King George V* for us to be able to follow the details. A great many yachts had entered for the race, especially many from foreign countries. The *King George V* was moored to a buoy quite close to Bellevue Bridge. South of her lay the flagship *Friedrich der Grosse* and the *Hohenzollern*. To the north the English ships, and to the east the *Victoria Louisa*, securely moored between two buoys. At 9 o'clock in the morning the 8 and 5 meter class started, at 10 o'clock the 19 and 12 meter class, at 11 o'clock the 15-meter class, and at 12 o'clock the special class. The roadstead was therefore covered with sails nearly the entire day. A very full program had been arranged for the 25th of June: At noon, breakfast with the squadron chief; in the afternoon, three features simultaneously—the athletic contest of the city of Kiel; reception on board the *Preussen*, flagship of the Second Squadron; and a garden party given by Dr. Ahlmann, the president of the municipal authorities. Finally, in the evening, an invitation to dine with the Emperor on board the *Hohenzollern*. Early in the morning a letter was received from Admiral v. Müller, announcing a visit of the kaiser on board the *King George V*, at 12 o'clock noon. At the specified time the entire crew of the ship took up their parade stations on the upper deck. The kaiser came on board in the uniform of an English grand admiral, looking very fresh and well, and apparently in the best of humor. He was accompanied by Admiral v. Müller and his flag lieutenant, Lieut. Commander Freiherr v. Paleske. All the English commanding officers and the officers of the *King George V* were standing on the quarter deck; Lieut. Kekrhann and I stood to the left. The Emperor had all the officers presented to him by Admiral Warrender. As the admiral was about to present us, also, the Emperor said, "I know my officers" and gave us his hand with the words: "Are you able to make yourselves pretty well understood here?" The kaiser did not review the crew as is customary on such visits, but immediately went with Admiral Warrender to the admiral's cabin, where he spent over half an hour conversing with him. Before leaving the ship, he wrote his name in the visitors' book of the *King*

George V, which had been placed on deck, and in which numerous important personages had registered. He talked some little time longer with the young Lord Erskine, who was wearing the Highlander full-dress uniform in honor of the occasion, and then very cordially took leave of Admiral Warrender and the English commanders.

The breakfast with Admiral v. Ingenhol passed off very agreeably. It was served in the admiral's cabin at small tables charmingly decorated with flowers. A small but select string orchestra played only German compositions. I sat with our first flag lieutenant and, as usual, Stopford and Buxton were with me. Ingenhol and Warrender delivered excellent speeches on the English and German fleets. Warrender even spoke a second time, and devoted his second speech entirely to the good feeling that had always existed between the two navies. He mentioned all his friends in the German Navy, with whom he had especially close relations during the course of his service, and in particular spoke of his friendship with Rear Admiral Sarnow.

It was a rather difficult matter to appear at the three simultaneous entertainments during the afternoon. With the help of fast autos and our good friend the barge, we readily accomplished this task. First of all we went to the athletic contest which the city of Kiel gave in honor of the English crews on the city athletic grounds in several autos which I had ordered at the Bellevue Bridge. The ladies witnessed the contest from the grand stand, while the admiral went about with us among the contestants. Warrender had a famous way of mingling with his men. He conversed with the simplest seamen concerning the contest as if he were one of them, and had them inform him of the results. The contest consisted of football, boxing, foot races, tugs of war, and similar sports. It was surprising how our men were victorious in almost every struggle. For example, the tug of war. The same picture was repeated several times: Our seamen pulled the Englishmen rapidly along. In not a single contest of this kind were the English sailors victorious. The same thing happened in the other games, with the exception of football, in which the strength seemed more equal. I was not particularly surprised at the victory of the German sailors. The English seamen were almost all little chaps; many of them were, moreover, very young—the *King George V* alone had 70 seamen less than 17 years old—and there were a disproportionately large number of rather old men. The tall, sturdy German type was much less often seen than among our men. I noticed that a great many appeared to be Jewish; this surprised me, as I know that the Jews had an inherent disinclination for the seafaring profession. It must have been the strong Latin strain which was noticeable among the English.

From the athletic field we went in the auto to the magnificent home of Dr. Ahlmann. Unfortunately it began to rain so that the entertainment could not be held in the park in the Dusternbrooker woods, but had to be given in the beautiful rooms of the great house. Tea was served, and we danced and flirted. We only stayed a short time and then went in the auto and barge to the *Preussen*. I had been given power to make unlimited use of automobiles by the naval station authorities, and only in this way was it possible to meet all the demands made on the admiral. Prince Henry and his consort were on board the *Preussen* which otherwise presented the usual picture of a reception on shipboard. The decks were beautifully decorated and there was much dancing. The commander in chief of the High Sea Fleet had detailed two German officers to each English ship to look after the English guests, and the German officers had been instructed to invite the English officers to breakfasts and receptions on board the German ships, consequently at every entertainment on board ship during Kiel week, numerous English officers were present, and this was also the case on the *Preussen*. I was constantly kept busy presenting society people of Kiel to the admiral. I knew so many people whom I presented, that he said to me with amazement, "Do you know everybody?"

We were invited to supper on the *Hohenzollern* at 8 o'clock in the evening. This was the last festive occasion celebrated on board the beautiful imperial yacht. The *Hohenzollern* on this day was for the last time seen in all her sumptuous magnificence. We assembled on the promenade deck, where the Emperor greeted us. He wore, as did we, merely mess uniform. The table was laid in the grand saloon, with wonderful orchid decorations. Germans and English sat in a brilliant row, side by side. I give in this place a diagram of the seating of the guests at this last great imperial supper on board the *Hohenzollern*. In this diagram the letters "K. Gr." before the title indicate "Koniglich Grossbritannischer" (Royal British). No speeches were delivered. Animated conversation prevailed, as everything is always made as informal as possible on board the imperial yacht. I had the good fortune to be seated next to Capt. v. Karpf, the commander of the *Hohenzollern*, one of the best beloved officers in the whole navy, who was celebrated for his brilliant humor. We thoroughly enjoyed the excellent menu and the choice wines. Capt. v. Karpf assured us that a certain Rhine wine we were drinking represented one of the choicest vintages stored in the imperial cellars at Berlin. I noticed that the Emperor was not perfectly at ease with Admiral Warrender. Unfortunately Warrender was seated in such a way as to bring his almost deaf ear next to the Emperor, so that the latter had to devote his conversation almost exclusively

to the British ambassador. After supper, coffee and cigars were served on the promenade deck and everyone engaged in informal conversation. The Emperor spoke with almost every one of his English guests; everyone commented upon how he took pains to act simply as a cordial host toward his guests.

I had a very interesting conversation with Capt. Dampier and Sir Arthur Henniker-Hughan over the political situation and Germany's prospects in the world. Both took the standpoint that England had no desire to exclude Germany from the world; if war, nevertheless, occurred, it would be Germany who took the first step, and not England. It was quite late when we returned to the *King George V*, but nevertheless we sat for some time still in the smoking room of the officer's mess. On such occasions I enjoyed friendly conversations with Commander Brownrigg, the gunnery officer of the *King George V*. He related many interesting details concerning the gunnery, showed me in his room the gunnery lists and the results of test firing and certificates of the prizes won. We met on common ground in our enthusiasm for naval gunnery. In the English Navy the gunnery officer's career was regarded as one of the most important and desirable for all naval officers. In the German Navy, it was not the big gun, but an accessory arm, the torpedo, which became the goal of desire of all energetic officers. I have always regretted this and considered it a great mistake. This preference for the torpedo had its justification, however, as our navy was still so weak that a battle for the control of the sea which must be fought out only with heavily armed ships, would seem foredoomed to defeat. During the war, immediately after the battle of the Skagerrak, Churchill very rightly remarked: "The leading sea power puts its reliance on the gun; the second, must center its hopes on the torpedo." Inasmuch as we did actually place our hopes almost entirely on the torpedo in the war, we did to a certain extent renounce the manner of fighting of a first-class sea power. Not until the battle of the Skagerrak—almost two years after the outbreak of the war—did Admiral Scheer, chief of the High Sea Fleet, venture a gunnery engagement on the high seas, after his predecessors Admiral v. Ingenohl and Admiral v. Pohl had failed to utilize the opportunities for a high seas battle which had often presented themselves. Commander Brownrigg told me about gunnery exercises which he conducted successfully at ranges of 15,000 meters. This range seemed to me excessive. As a matter of fact, engagements were fought in the war almost entirely at greater ranges.

Admiral Warrender was invited by the Emperor for a sail on the *Meteor* on Friday, 26 June. The large yacht started at half-past 10 in the morning. As I did not have to accompany him on this occasion, I was able to witness the preparations for the big reception

which was to be held on board the *King George V* in the afternoon. The Imperial Yacht Club had also arranged a sailing regatta for the afternoon for the boats of the English warships. For the evening invitations had been issued by the officers of the Baltic Naval Station to a ball at the Naval Academy.

Admiral Warrender did not return from the sail until afternoon. We had meanwhile enjoyed a very pleasant lunch at which Sir Edward Goschen presided and to which certain young ladies had been invited. The admiral was charmed with the regatta in which the Emperor had come off victorious with Rear Admiral Begas at the steering wheel. The at home on board the *King George V*, as the English call such functions, was a huge affair of first rank. All Kiel was there, and all the invitations had passed through my hands; naturally some were greatly displeased at not being invited. Lady Warrender did the honors with great skill, in which she was assisted by certain German ladies, in particular her friend Frau v. Meister and also the wife of the president of the government board at Wiesbaden. The immense decks of the *King George V* won the unlimited praise of the ladies because of the great floorspace for dancing which they afforded. Borchert of Berlin had furnished delightful refreshments which were heartily praised by everyone. I made the acquaintance of the old Lord Brassey who was at Kiel on his yacht, *Sunbeam*, to which he invited me. He had written a well-known book on a cruise around the world in this yacht. I also met his daughters Lady Helen and Lady Marck. The yacht is rather old but very large and comfortable. For days afterwards, a remarkable story was current concerning Lord Brassey. In one of the small boats of his yacht, he had entered the U-boat harbor of the imperial dockyard, which was closed to all civilians and where several of our newest submarines were lying; he was arrested there by a dockyard watchman and locked up for several hours in a guardroom. Not until he had established his identity through a German officer who knew him, was he released at the order of the Director of the Dockyard. People in Kiel were generally incensed at the great lack of tact of the lord, and the ambassador also expressed himself quite sharply on the matter.

I realized on the very day of the arrival of the English ships at Kiel that the English were very eager to learn all they could about the modern ships and vessels of our fleet. On this same day, Admiral Warrender sent me to Admiral von Ingenohl, chief of the High Sea Fleet, with a message to the effect Admiral Warrender placed the English ships at the disposition of German naval officers for inspection. Admiral Warrender at the same time expressly stated that the German officers would be shown everything of professional interest that they wished to see. Admiral von Ingenohl rejected this offer

positively and commissioned me to say to Admiral Warrender that he was sorry he could make no use of this kind offer, as he was not in a position to return like with like, since according to our regulations many of the features of our ships could not be shown to anyone. I conveyed this message to Admiral Warrender, and on this same day he again sent me to Admiral von Ingenohl to report that they also, obviously, had such regulations and that, for example, the conning tower, the torpedo rooms, and the wireless telegraphy could not be shown. Everything else was open to inspection, and he had no fear that anything would be shown to his officers which was contrary to our regulations. Nothing further was done until 26 June, when Admiral von Ingenohl gave his answer in a letter to me in which he directed me to report to Admiral Warrender that he thanked him for the offer to show the English ships to the German officers and requested that the English officers would also inspect the German ships. At the same time, an order was issued to the German commanding officers by Admiral Ingenohl that English officers would be permitted to visit the German ships, but that the regulations governing visits by foreigners would be observed. As these regulations stipulated that none of our most modern ships, the ships of the Third Squadron and the battleships, as well as the latest destroyers, and no submarine could be visited by foreigners, nothing remained for the English to see but the old battleships of the *Deutschland* class, and assuredly they would not derive much benefit from an inspection of her.

The English themselves had prepared their ships—which, it is true, were the most up-to-date of the English Navy—for the visit by German officers, by either removing all important apparatus, especially all sighting and fire-control devices, or by concealing these behind wood planking. Nevertheless, on several occasions and without any request on my part, the apparatus of the *King George V* was very thoroughly shown to me. Commander Brownrigg took me into the remotest corners of his gun turrets and ammunition rooms. The celebrated "firing director" of Percy Scott was one thing around which every officer threw the veil of secrecy. This was an apparatus by the aid of which all the guns could be aimed and fired from the conning tower or from the foremast, and was the invention of the English Admiral Percy Scott. Naturally the English officers who accompanied me questioned me concerning similar devices in use in our navy, but they could get very little out of me.

The ball given on 26 June in the handsome rooms of the Naval Academy in honor of our English guests by the officers of the Baltic Naval Station was a brilliant affair. In the "flower waltz" flowers were used in a lavish abundance as I had seldom seen, making the

event a truly flower festival. The dancing continued until late in the morning.

For Saturday, 27 June, we were invited to a breakfast at noon, by the city of Kiel, and to a garden party in the afternoon by the chief of the naval station. Admiral and Mrs. Warrender had issued invitations to a dinner on board ship for the evening.

About 1 o'clock p. m. we assembled in the beautiful rooms of the new town hall of Kiel in which was to be given by the city of Kiel the breakfast in honor of the English officers. Chief Burgomaster Lindemann delivered an address in compliment of the English, to which Admiral Warrender admirably responded in honor of the city of Kiel, and incidentally of everything that had particularly pleased him. He narrated how the German officers had received the squadron in their motor launches, and how the officers had got on board at sea. He also spoke some appreciative words concerning myself and my activities. After Grand Admiral von Köster, as honorary citizen of Kiel, had spoken of the English Navy, Admiral Warrender again replied in a brilliant manner. The breakfast lasted so long in consequence of the numerous speeches and toasts that we just had time to hasten on board with the auto and barge to change our uniforms for the garden party.

The historical garden party given the chief of the naval station, at which the Emperor was always expected but which he never attended, passed off very pleasantly, under brilliant skies. Prince Henry and his family and Princess Marie of Holstein-Glücksburg were present. Prince Adelbert failed to appear this year, for the first time since the establishment of Kiel week. The Empress, the crown prince, and the other Prussian princes, also failed to come to Kiel this time, contrary to their usual custom. I was assured from authoritative sources that the Empress and the princes stayed away because of the presence of the English. I consider this aloofness toward a nation whose Government had so often affronted ours very proper, especially as the cool reserve of all important German personages had not failed in its impression on the English. The garden party of the station chief presented an especially good picture this year. People stood about, talked with this one and that one, and drank a cup of tea, while the young people danced in the large ballroom of the house. In addition, the lancers were danced on the lawn in the garden by ladies and gentlemen of Kiel society who had previously practiced, in which I also took part. A huge red rug had been laid on the lawn back of the house, on which some wicker furniture was placed for the most distinguished guests.

Admiral Warrender received an invitation for himself and Mrs. Warrender, while at the garden party, to take supper on board the *Hohenzollern*. The invitations issued for the dinner party on board

the *King George V* consequently had to be recalled, with the exception of a few young ladies with whom we dined very pleasantly that evening. Sir Edward Goschen again presided and enjoyed himself very much with the German ladies who aided him in his position as host. There was dancing on deck of the *King George V* after dinner, and then we proceeded to the Hamburg-American liner *Victoria Louisa*, on which we danced again. Here more than anywhere else was the international character of Kiel week obvious. All languages were spoken. As the dancing floor was very much crowded, Stopford, Buxton, and I hunted up a couple of nice fellows and returned to the *King George V*, where we continued our dancing. Among others, the two young grandsons of Prince Bismarck came with us. It was quite late when the last guests left the ship. Thus ended the last day before, for us, the fateful day of Sarajewo, in happy social intercourse with our English guests.

A very full program was provided for Sunday, the 28th of June. Admiral and Lady Warrender were invited to breakfast with Grand Admiral von Tirpitz. In the afternoon there was to be a large reception at the royal palace and in the evening dinner with the station chief, followed by a ball.

I was not invited for the breakfast with Grand Admiral v. Tirpitz, consequently I had my noonday meal quietly at home. When I returned to the *King George V* I was called on the phone and received the following order which had been issued by the Emperor: "Flags half-mast; top-flag half-mast; Austrian flag at main mast, owing to the murder of the Austrian heir apparent." Admiral Warrender and Sir Edward Goschen immediately came on board from the *Friedrich Karl*. Both were very serious; the ambassador deeply shaken. I reported the telephone message to them. I stood quite a while with them on deck. Sir Edward Goschen had tears in his eyes, so I asked him if the murder had any special significance for him. He merely said that he had been closely associated with the Austrian heir apparent and had esteemed him highly as a friend. Goschen then said to Warrender that they must send a telegram to Sir Edward Gray. I therefore withdrew. When Warrender came again on deck he was still more grave. He spoke to me very fully concerning the result which the murder might have. He very frankly expressed the fear that this murder would lead to war between Servia and Austria, that Russia would then be drawn into it and that then even Germany and France could not remain outside. He said nothing whatever concerning England, but he finally stated that this murder might unchain a general world war. I gave this conversation in my official report, which I handed in on July 4, 1914. While we were still talking on deck, Prince Henry came on board to bring the news of the murder, and to discuss the same with

Sir Edward Goschen and the admiral. He reported certain details of the murder.

The whole aspect of Kiel week changed suddenly. The reception at the palace and the ball to be given by the station chief were canceled. The *Victoria Louisa* received notice from Hamburg to report there on the following day. The sailboats took their departure. Dances continued to be held, however. The sultry atmosphere which filled the world immediately before the outbreak of the war began to make itself felt. In the afternoon information was given out that the Emperor would leave two days later.

On Monday, June 29, we left very early in the barge for the railway station, Warrender and Goodenough with their staffs, Lieut. Kehnhahn and myself. The admirals and * * * who had been ordered to be present assembled on the landing bridge. Immediately before the arrival of the Emperor, came Her Majesty the Empress, who had been driven hither in an auto from Grunholz, and who was to accompany the Emperor to Vienna. She was dressed entirely in black and showed that she had been weeping. The Emperor's boat came alongisde, and the Emperor climbed on board with his followers. He looked deadly serious. He received various announcements, including Warrender's and Goodenough's notice of their departure. He conversed several minutes with each of them. He then talked quite a long time with Sir Edward Goschen; also with Mr. Armour, the American, the Prince Munster, Admiral v. Ingenohl and others. We followed to the train and gave our greetings as it pulled out. A serious stillness prevailed, even over the great crowd which had gathered in spite of the early hour.

During the forenoon the admiral took part in the burial of Lieut. Schroeder who had fallen with his airplane. At noon an official dinner was served on board the *King George V*, to which in particular the German admirals and their wives were invited. Owing to lack of space, it had been possible to invite only a limited number. Among the guests present were Grand Admiral von Tirpitz, Admirals von Coerper, and von Pohl. A very simple meal was served, which differed from the daily lunch served only by some very good wines. After the meal Admiral Warrender offered to show the admirals over the *King George V*. Strange to say, Admiral von Ingenohl accepted the invitation, while Grand Admiral von Tirpitz and the other admirals declined. Admiral Warrender then took Admiral von Ingenohl and his officers, whom I joined, to a 34.5 centimeter turret, and Commander Goldie there showed us all the mechanical devices of the turret in operation.

In the afternoon I went with the admiral alone in the auto to the dockyard recreation house where an entertainment was held for the crews, which was given by the English to our sailors in return for the

similar entertainment given to them. As the admiral entered the hall he was greeted with a thunder of applause, a spontaneous honor which made a deep impression on me. Warrender then sprang upon a table with youthful agility and delivered a stirring speech on the friendships of the two nations, which ended in three hurrahs for the German Navy. Rear Admiral Mauve replied, likewise standing on a table. As he finished his speech, three cheers were given for the English Navy; Warrender grasped his hand and stood before the eyes of the German and English crews hand in hand with a German admiral in a somewhat theatrical pose. A wild stamping of feet, which was renewed again and again was the answer.

During these days Warrender often talked with me concerning what form a naval war between England and Germany would take. I was specially interested at his saying that in England no particular importance had been attached to the Bay of Scapa Flow until the appearance of several articles by German naval officers, and that they began to develop Scapa Flow as a point of support for the so-called extended blockade of the German bay. He said in so many words: "Scapa Flow is a German discovery." He and the officers of his staff often laughed at the well-known submarine letter of Admiral Percy Scott, in which the latter had said that the submarine marked the end of England's control of the sea. Admiral Warrender did, however, admit that the strategical conditions would be fundamentally changed in the future by the submarine, and that on account of the submarine only an extended blockade—in Norwegian waters—would be possible in the future.

On the evening of 29 June the stag dinner at the Imperial Club took place. The distribution of prizes, which Prince Henry made as a representative of the Emperor, took place beforehand. A great number of yacht owners and naval officers had assembled at the yacht club for this ceremony. I shall never forget the searching look with which Warrender examined each young officer as he was called up, in order to form an impression concerning him. He was especially interested in the officers of our submarines, with whom he and his officers always endeavored to become acquainted in as great numbers as possible.

All kinds of interesting people were present at the dinner in the club: General and Field Marshal von der Goltz Krupp, the naval attachés of foreign Governments, among others. For the last time I slept on board the *King George V.*

Thursday, 30 June, had been set for the departure of the English fleet. I was sorry that this to me highly interesting period was at an end. At their request, I gave my picture to Stopford and Buxton, the staff officers with whom I had always had such friendly relations, and they presented me with theirs in return. I presented each one,

in addition, with a small case of good Rhine wine. The two together gave me in return a very handsome silver ink bottle, which they had ordered sent from England on the 30th of July, 1914, and which was presented to me at the end of August, 1914, through the German Admiralty staff.

Admiral Warrender presented me, as a farewell gift, with a wonderful scarf pin set with a large ruby and diamonds.

I had it in my possession only a short time, as in August 1914, I placed it at the disposal of the Red Cross.

I remained on board until the ship cast off from her buoy. I then took my leave. Everyone was very cordial. I said good-by with grateful feelings. I shall never forget the fatherly, thoughtful hospitality of the English admiral, in spite of the evil that the English nation has since done our nation, which has made it impossible for me as a right-thinking German man of honor to have friendly intercourse with an Englishman for the time being. The demand for the delivery of our Emperor has created an impassable gulf between us and the English. I entered my boat and watched the ships rapidly leave the harbor. On the German ships the signal "Glückliche Reise"—successful voyage—was flying.

As the vessels moved out of the harbor, Warrender, as a farewell greeting of his squadron to the German fleet, sent the wireless message: "Friends in the past and friends forever."

PART II.

CHAPTER I.

The First Encounters with the English Naval Force.

On 15 December, 1914, I witnessed an encounter between German and English ships for the first time. On this day our battle cruisers bombarded the fortified English port of Scarborough. I must congratulate myself that from on board a battleship I witnessed the defeat of an English torpedo boat in the early morning hours by the *Hamburg*. At about the same time a meeting with our friends of Kiel week took place, which was highly interesting but which for obvious reasons has not yet been made public. Our small cruisers had been attached to our battle cruisers to take part in the bombardment. Such a high sea was raging on the English coast and the weather was so stormy that it was impossible to use the guns of the small cruisers. The leader of the battle cruisers, Vice Admiral Hipper, therefore decided to send the small cruisers back to the main body. The execution of this order involved the great danger that the small cruisers might be attacked by superior forces on the way.

About midway of the distance to be covered, our small cruisers came up with an English squadron of small cruisers which was apparently under the command of Commander Goodenough. Owing

to the thick weather the vessels constantly found themselves quite close together. The English leading ship sent a Morse signal of recognition, consisting of two letters, by means of her searchlight. This was read by the German leading ship and answered by letters of the Morse alphabet chosen at random. The English realized whom they had in front of them and opened fire, which was immediately returned by the German cruisers. Owing to the rough weather, however, it was practically impossible for either side to use their guns with any effect. A squall of rain came on and the ships were lost to view. Immediately thereafter our six small cruisers ran into the eight dreadnoughts of the second battleship squadron, under the command of Vice Admiral Sir George Warrender. With great presence of mind, the leader of the German small cruisers immediately sent the English signal of recognition which he had picked up a short time before. This deceived the English, who thought themselves in touch with their own small cruisers. That was the salvation of our ships, for a few broadsides from the 34.5 centimeter guns of the *King George V* close up would have finished our small cruisers. The two squadrons remained in sight of each other for only a short time, when they were again lost to view in the rain squall, and the small cruisers soon after came up with our battleships, happy to have escaped their great danger. I can imagine that neither Admiral Warrender nor his flag lieutenant, Buxton, looked very well pleased with themselves when they learned later what kind of ships they had had in front of their guns. Sir George Warrender was very soon thereafter relieved from his command of the squadron and given duty on shore; very likely because he had allowed to pass unused the only opportunity which fate had offered him for a successful engagement. I learned in 1916 from a wireless message of the English intelligence department that he had died while chief of a naval station.

The next bombardment of the English coast by German battle cruisers took place on 25 April, 1916, and this time as first gunnery officer of the S. M. S. *Derfflinger*, our largest and most heavily armed battle cruiser, it was my duty to direct our hail of iron on the harbor works of the cities of Lowestoft and Great Yarmouth.

At the beginning of the bombardment of the harbor cities, two small English cruisers and about 20 destroyers came out from Lowestoft and a short battle developed between us and these naval forces after the completion of the bombardment. This engagement, in which we could easily have annihilated the larger part of the enemy forces, was broken off after a few minutes, as a small cruiser which we had stationed as a sentinel to the south announced the approach of superior enemy forces. It thus happened that we had no real success in this raid, although in the few minutes of the battle we set fire to a small cruiser and sank one or two torpedo boats. The

announcement of the small cruiser proved later to be incorrect. As we were leaving the coast, a land flyer attacked us before "flacks" (Flugzeug abwehrkanonen, antiaircraft guns) closed in on him so well that he flew off, and the severely wounded officer was barely able to reach the coast, as I saw later in an English paper. In spite of the meager military effects against the English light forces, the attack on the English coasts was a gratifying act of war. I shall never forget how the English coast came into view in the early dawn as we made out the details of Lowestoft and Great Yarmouth, and then let loose our mighty salvos from the heavy guns against the harbor installations. Garch Fock, in his book "Norsdee," published by Mr. Glogau, jr., Hamburg, speaks of this voyage on the 24th and 25th of April, 1916, against the English, in the "Day and Night Book of S. M. S. *Wiesbaden*," the same ship on which he perished in the battle of Skagerrak. The following vivid sentences by him will show the deep impression this voyage made upon the poet:

"About noon the whole ship showed that we were prepared for an attack on England; that perhaps a great and important event is about to take place! Firing and fighting everywhere! A world power raging over death and life. A great fleet! We were only the drivers and the enormous gray torpedo boats are merely the hounds from the ranks of a *Lutzow*, a *Seydlitz*, and *Derfflinger*. Have a care John Bull, have a care! German scorn, the fierce living scorn of a Siegfried over the faithlessness of the Saxons will overcome thee.

* * * * * * *

"How the ship trembled! As far as the eye could reach, German ships, plowing, chasing through furrows, hunters, and hounds! The sea becomes suddenly more blue; the crests of the billows rise higher, the waves at the bow become whiter, the wake more frothy! It suddenly grows dark. Now in deadly earnest we plough into the night, the sea grows higher. Ever and anon a Morse light flashes out. The torpedo boats can scarcely be seen. Only the white foam shows us where they are.

"The ship had become a fire-spitting mountain. Our neighbors too are Vulcans. A furious giant with superhuman powers is at work. All the ancient gods have arisen and are fighting with us, Valhalla in the Gotterdammerung. No light upon the sea! With their age-old and primitive power they threaten with the hammers of night! A Zeppelin sails overhead, a shadowy streak in the clouds of night. The stars are * * * ."

The rest of this journal went down with the poet on board the *Wiesbaden* in the battle of Skagerrak.

PART II.

CHAPTER II.

The Gunnery Fundamentals of Battle on the Open Sea.

On the day of the bombardment of Lowestoft I learned many things which were very useful to me later in the battle of the Skagerrack. A few failures of the material and mistakes on the part of the crew clearly demonstrated to me that it was possible to attain satisfactory fire control only when all the gunnery instruments worked perfectly and when the guns were served by expert crews. Only when the instruments of the gunnery officer are in perfect order is he able to obtain the maximum fire effect from his guns, and only then can the officers, gun captains, and gun crews prove that they know how to properly handle those complicated instruments, mostly hydraulic and electrically driven, that the turrets, secondary battery ammunition rooms, and only then when they have kept them in such excellent condition that the men will find themselves ready to load their guns in the quickest possible time and able to fire immediately upon the sounding of the firing signal. In order to attain this perfection all the electrical and mechanical devices relating to the guns must be gone over very carefully each day and every defect noticed must be immediately remedied by the gunner's gang. Let me place on record here a testimonial to the efficiency of the personnel of the *Derfflinger*. At the head of 9 gunners' mates and more than 20 strikers, stood gunner's mate Wlodarczek, known thoughout the ship as the "Henzelmennchen" (gnome), for with him to think of a thing was to have it done. It was carried out often before thought of. It was he whose great help assisted me so much in carrying out my plans in the battle of the Skagerrack, in all the great amount of firing done by the guns of the *Derfflinger* scarcely a casualty occurred that was not caused by the effect of enemy hits. This could only be brought about by the employment of every precaution for the ordnance matériel and magnificent was the ordnance of the ship. The ship had cost between seven and eight million marks in building, and had been improved since the war by conditions costing many hundred thousands.

In the forward part of the ship, the forecastle, were two immense turrets, each containing two 30.5 centimeter rapid-loading guns. Two more turrets were in the afterpart of the ship. These four turrets, with their eight 30.5 centimeter guns, constituted the main battery of the ship. The turrets were named in the order of the alphabet, "Anna," "Bertha," "Caesar," and "Dora." "Anna" was the turret farthest forward, "Dora" the one farthest aft. Each turret had a turret officer, who was either a lieutenant or a lieutenant junior grade. Owing to the shortage of officers on board, the "Dora"

had no turret officer, but was served by a chief petty officer and an assistant. To the turret "Bertha" our men had given a special name. It was generally called the "Schulzburg" after its commanding officer, Lieut. Frieher von Speth-Schulzburg, who was especially beloved by his men.

The secondary battery of the *Derfflinger* consisted of fourteen 15 centimeter rapid-fire guns, seven on each side, each one installed in an excellent armored casemate. In light guns we had also four 8.8 centimeter antiaircraft guns, called flaks. The remaining 8.8 centimeter guns had long ago been turned over to our brave mine-sweepers and our merchant ships in the Baltic.

The ammunition for these guns was stowed in about 50 ammunition rooms, which were very well protected against torpedo fire by strong nickle-steel torpedo bulkheads. For manning our entire battery we had 3 lieutenants, 3 lieutenants junior grade, 4 ensigns, 4 midshipmen, 6 warrant officers, and about 750 petty officers and men. The entire crew of the S. M. S. *Derfflinger* numbered 1,400 men. I was in command of the entire battery as first gunnery officer, but in battle I directed only the main battery; the secondary and antiaircraft battery were in charge of two of my officers, to whom I gave only general instructions for tactical purposes.

In order to gain an idea of the bigness of the gunnery engagement that took place in the battle of the Skagerrak, one must first be able to form some conception of how a ship can fire its guns and hit the target while driving at full speed ahead through heavy seas, rolling and pitching, executing maneuvers, and sudden changes of speed; in other words, while undergoing continuous changes in elevation and azimuth how it is possible at ranges of more than 20 kilometers, not only to occasionally hit the enemy's ship but to absolutely demolish it. The enemy, too finds, himself in the same predicament; he also turns and twists, rolls and pitches, and endeavors just as we do to avoid the deadly hail of projectiles by constant changes of course. I should like to describe briefly here what I consider necessary for an understanding of firing on the open sea, if my readers wish to obtain a true picture of the battle of the Skagerrak. In doing so, I shall make the gunnery equipment with which we fought on board the *Derfflinger* and with which all modern battleships are similarly provided, the basis.

Of primary interest are the gun-control stations, from which we, as gunnery officers, control the fire. The forward control station was an armored platform which formed the after part of the true conning tower, and from which the commanding officer aided by the navigating officer, aides and signal officer conduct the movements of the ship during an engagement. During the engagement I stood in this forward gun-control station, together with my third gunnery

officer who directed the secondary battery, one ensign, three petty officers at the "direction indicator" (a security device which I shall describe later) five messengers at the transmitters and two range finder men. Below us, separated only by a perforated sheet-metal deck on which we stood, were six messengers at the transmitters, and below these again, in the so-called "pear" (the conning tower as viewed from below assumed the shape of a pear) was one petty officer, two messengers at the transmitters and one gunners mate in reserve. There were, therefore, no less than 23 men in my fire-control station. It was pretty crowded, but nevertheless, we were well placed in our station. It was a splendid station, protected by a nickel steel armor plate about 350 millimeters thick. A direct hit from a 30.5 centimeter gun fired at short range was not able to penetrate our armor; the impact shook us up pretty thoroughly and it seemed for a moment that the whole station would be carried overboard; but we remained uninjured except for a few slight wounds.

In addition to the forward fire-control station for battle, there were two other fire-control stations: The "after conning station," where my assistant, the second gunnery officer, had his station and then the "foremast," usually called the "crow's nest." The "crow's nest" was in the foremast about 35 meters above the surface of the water. It consisted of a circular sheet-metal box in which sat the observer for the secondary battery and an assistant, with two order transmitters, who observed the fall of the shot on the enemy through high-powered glasses and announced the fall of the shot on the enemy target to our battery officers by means of their head telephones.

The stations of the ship next in importance to the fire-control stations were the central stations, two rooms located far down in the ship.

These stations were located beneath the armored deck and, therefore, considerably below the water line; they were protected by armor belt and coal bunkers, and so far as human skill could make them safe from enemy hits. All orders from the fire-control officer were transmitted to this room through head telephones and speaking tubes, and were transmitted from there to the various guns by means of various devices. The first step in any firing at sea at long range is a very accurate measurement of the distance of the target. We had on board for this purpose seven very large range finders capable of giving good results up to the ranges of 20,000 meters. Our measuring instruments were all made by Carl Zeiss of Jena and were based on the principle of the stereoscope. They were the so-called base-line instruments. Two men sat at each of these range finders; one sighted and the other read off the range in hectometers, and transmitted this reading by telegraph. The telegraph carried these adjustments to the so-called base line "averager," an apparatus

which automatically averaged the adjustments of all the range finders. This base line "averager" was installed in the forward control station, quite near to me, and it was possible, therefore, to read from it the average of all the ranges as measured by all the instruments. The ranges thus read off were transmitted to the guns at the beginning of the fight by the fire-control officer.

As soon as the fire-control officer was convinced as to which of the enemy's ships he should direct his fire upon, he turned his periscope upon the enemy. "Periscope?" some of my readers will ask in surprise. Yes, the gunnery officer, as well as the commander of a modern dreadnaught no longer observes the enemy through a telescope or binoculars, but stands in front of just such a periscope as is used by the commanding officer in his submarine. At the lower end, hence at the conning or gunning station, is the eyepiece, the objectives being located above the roof of the conning station. This has the great advantage that during an engagement the small peepholes of the conning station can be kept tightly closed by armored covers, so that one, therefore, fights as it were with the visor down. On the periscope of the gunnery officer is the previously mentioned direction indicator, a most ingenious device and of the greatest importance in fire control. This device performs the following astonishing feature: It causes each gun of the ship which is connected up with the direction indicator to follow every motion of the periscope of the gunnery officer. Moreover, by different adjustments at the periscope, all the guns installed at distances up to 100 meters apart, by cutting out the parallax, are aimed at one and the same point, namely, the point lying in a line of vision of the periscope of the gunnery officer at the measured distance from the ship or at the range determined by ranging shots. And that is where the enemy stands.

All the guns by the operation of the direction indicator are constantly kept accurately aimed at the enemy without the necessity of anybody at the gun seeing the enemy at all. This is the marvelous feature: The enemy may be near or far away, he may be in front or behind us, the ships may be traveling along side by side or passing each other—so long as the periscope is directed on the enemy and so long as the correct range is indicated on the periscope, all the guns are kept accurately aimed at the part of the enemy ship which the periscope is observing. Even when one's own ship turns, the guns remain on the target, provided the periscope is properly trained. This duty devolves upon a special petty officer who keeps the periscopes constantly aimed at the point on the enemy water line designated by the gunnery officer. For this purpose the petty officer has a special lateral eyepiece on the periscope. For obvious reasons I can not go into details here concerning the construction of the direction indicator. I will add, however, that naturally the gun turrets

are not directly moved by moving the periscope, but only an electric indicator in each turret to which the adjustments for range and deflection are transmitted. An indicator rigidly connected with the gun turret is kept constantly in line with electrical indicator as the turret rotates, and the slightest movement is accurately followed by the turret captain, and in this way the heavy gun turrets follow every movement of the periscope.

We now know how the guns are aimed at the enemy. We also know how the first ranges are obtained. The guns must now be given the elevation corresponding to the range, that is to say, the range scale (the sight on the Infantry gun) must be set to correspond to the range of the enemy. With the constant change in range, which varies from minute to minute by more than 100 meters as the two opponents approach or draw away from each other, at high speed, it is not enough that the elevation be ordered by the fire-control officer and then connected to the guns by the order transmitter by word of mouth. An ingenious and much more efficient apparatus is used for this purpose.

In the central fire-control station stands a so-called sight telegraph. When this sight telegraph is adjusted to the given range, an electrically operated indicator on each gun is automatically set for the given range. Hence, when the indicator on the range-scale sight is brought in line with the electrically controlled sight indicator, the gun is correctly aimed. No one at the gun need know, therefore, how many hectometers distant the enemy is in order to make the proper sight setting; the sight is correctly set if the two indicators are merely kept in line.

Still another important device, the so-called range clock, is installed on the sight telegraph. Let us assume, for example, that the gunnery officer has determined by computations and estimates, concerning which I shall speak later, that our ship is approaching the enemy at the rate of 750 meters per minute. He will then give the command: "Difference in range, -7.5." The man at the range clock then sets this clock at speed of "-7.5." If he now lets the range clock run, the range as set on the sight telegraph will diminish at the rate of 7.5 hm. (hundred meters) without it being necessary to give any order.

We therefore now have a gun on which the desired sight adjustment is set, which is also accurately trained upon the enemy, but which, owing to the heavy rolling of the ship, is at one moment pointed into the water and the next into the heavens. In order to be fired, the gun must naturally stand as if mounted on the earth exactly horizontal on a fixed platform. As this is not possible aboard ship, the skill of the gun captain must make up for this. In spite of the rapid motions of the ship, the gun captain must see

that the line of sight of his gun remains constantly directed on the enemy. This naturally requires years of daily practice. And for this reason it was truly astonishing what skill our gun captains developed. This firing with a rolling ship constitutes one of the most important points in the training of our men at sea. Numerous ingenious devices have made it possible for gun captains to keep up their training of this kind even on board an anchored ship in port. Small disks representing the target are moved in front of the gun, and thus not the ship with its guns but the targets are moved, which amounts to practically the same thing, since the targets are moved in curves which correspond to the motion of the ship.

For the past 10 years the navy has been experimenting in an effort to replace the duty of the gun captain by a cleverly devised apparatus. As a matter of fact, it has succeeded in doing this. A complicated gyroscope mechanism, that represents one of the most ingenious devices that the human brain has ever conceived, automatically fires the loaded and armed guns at the moment in which the sighting telescope is pointed at the enemy. Furthermore, this apparatus takes accurate count of the rate of rolling and therefore discharges the gun in a rapidly rolling ship sooner than in a slowly rolling one. This is necessary for the reason that some little time elapses between the moment of firing and the moment in which the projectile leaves the muzzle of the gun. Anyone who knows how the motion of a ship varies in rapidity will be able to judge what a difficult problem our technicians had to tackle in this instance.

I have digressed here in describing an apparatus which we did not have on board in the battle of the Skagerrak, but which was issued later. I wish to mention it, however, because it represents in a certain way the highest point capable of being reached in the development of aids in gun firing at sea.

I would like also to make a few statements concerning the heavy artillery of the *Derfflinger*. I have already said that the eight 30.5-centimeter rapid fire guns were installed in the four turrets. Let us examine these 30.5-centimeter turrets a little closer. The principal part was rotatable; it consisted of a heavily armored rotating turret and the turntable on which the two 30.5-centimeter guns stood. The turret was rotated or trained in azimuth as they say on board ship, by electricity. Alongside the guns were the ammunition hoists which also turned when the turret was rotated. Back of the guns was stowed a supply of ready ammunition, about six 30.5-centimeter shell for each gun. We had two kinds of projectiles: Armor-piercing shell and explosive shell. The armor-piercing shell, which were painted half blue and half yellow, were

made of the best nickel steel, contained only a comparatively small explosive charge. The purpose of the armor-piercing shell was primarily to penetrate the thick armor of the enemy and then explode inside. Naturally the explosive effect together with the enormous power of penetration could be but small. The explosive shell which was painted yellow throughout possessed, on the contrary, only a rather thin steel covering in which a large explosive charge was contained. These shells could not penetrate the thick armor of the enemy, but had an enormous explosive effect on impact on unarmored or slightly armored targets.

Our powder charges were contained in brass cases. A 30.5-centimeter cartridge, therefore, looked very much like an enormous shot cartridge used by hunters, except that the entire case was made of brass. Large cases of this kind were very difficult to manufacture. They were also expensive and rather heavy. In spite of this we, in the German Navy, used such cases even for our largest guns, and this measure protected us generally in the war from such catastrophes as befell the *Indefatigable*, the *Queen Mary*, the *Invincible*, and the old armored cruisers in their utter destruction in the battle of the Skagerrak. However, we were not able to stow all the powder necessary for one shot from large calibers in a single brass case. In addition to the so-called main cartridge (in a metal case) we therefore had to use a so-called fore cartridge, the powder of which was contained in a double silken bag. These fore cartridges were naturally much more easily ignited than the main cartridges. All the powder charges of our enemy were contained in silk bags. Our cartridges, prior to being placed alongside the gun or in the ammunition hoists, were kept in strong lead cases so that it was almost impossible for fire to reach them, while the packing of the English ammunition must have been very defective. The utter destruction of a ship by its own explosion has happened only twice in the German Navy: The *Pommern* blew up on June 1, 1916, on the morning after the battle of the Skagerrak, and the *Prinz Adalbert* immediately before in the Baltic, in both cases from torpedo hits. The storing of powder charges, especially of fore cartridges, naturally represented for us a great danger. We had therefore been ordered, as a means of preventing disasters, to keep only one fore cartridge and one main cartridge on the turntable near each gun. This order applied to the lower tier of the turrets also.

The rotating turret stood on a fixed gun turret which extended through several decks and rested on the armored deck. The interior was divided into several tiers; the reloading room, the switch room, the shell room, and the cartridge room, hence, including the turntable, there were 5 tiers in all, in which from 70 to 80 men were distributed. In the shell and cartridge rooms were also ammunition hoists which extended up to the reloading room. In the reloading

room, the ammunition was transferred to the upper ammunition hoists. The purpose of the reloading was to accelerate the delivery of the supply of ammunition to the gun. We had no ammunition hoists extending all the way through. Reloading caused just that much delay in forwarding the individual shells and the cartridges from their rooms to the guns. Nevertheless there were always two projectiles or cartridges for each gun on the way. Inasmuch as a small supply of shells and cartridges was always kept in the reloading room, this room served as the reservoir from which the gun was supplied, and not the shell and cartridge rooms. The time required for bringing ammunition to the gun was determined therefore by the time necessary for the upper hoist to convey the ammunition from the reloading room to the gun, and amounted to only half the entire time required for conveying the ammunition from its storeroom to the gun. We are able, easily, to fire with each gun every 30 seconds. In the battle of the Skagerrak I was able to fire a salvo of four shots every 20 seconds for quite a long time; that is, to fire one shot from each turret, which would not have been possible with the continuous ammunition hoists possessed by the older ships.

In addition to the convenience in the reloading room, were also the hydraulic pumps for training in elevation, and numerous other accessory devices. In the storage room was the switchboard for all the electrical mechanisms of the turret. In the ammunition rooms were the various devices for transferring ammunition, most of which were operated electrically. A 30.5-centimeter shell weighed about 400 kilograms, a cartridge about 150 kilograms. The crew of a turret consisted of 1 lieutenant commander or lieutenant as turret officer, 1 gunner as turret captain, and about 75 petty officers and men. These were distributed as follows: On the turntable was the gun crew, consisting of 4 petty officers and 20 men, besides a few order transmitters and 1 range taker; in the reloading room were 1 petty officer and 12 men; in the switchboard room, 1 gunner's mate and 3 strikers; in the shell room, 1 petty officer and about 18 men; and in the cartridge room, 1 petty officer and about 14 men. In battle about 12 men were added to this turret crew as reserve. About 360 men, therefore, made up the crews for all the heavy guns, to which 25 orderly transmitters should be added.

The crew of the 15-centimeter gun was much smaller. Each gun, which was aimed solely by hand, was served by a crew of 10 men in each casemate, in addition to which about 4 or 5 men were in each 15-centimeter ammunition room. This made 15 men for each gun, or 210 men for the 14 guns of the secondary battery, to which 20 order transmitters should be added.

I fear that I have already detained the reader too long with this detailed description of the battery. Therefore, let us bring it to

an end for the present. When I speak later on of the gunnery duel in the battle of the Skagerrak I shall mention some other ingenious instruments which have been invented to aid the gunnery officer in the control of the guns, especially relieving him of a portion of the calculations constantly necessary in fire control while under way, owing to the frequent change in course of one's own and the enemy ship.

The day of Lowestoft and Great Yarmouth left us, as I have already stated, with a vivid feeling of dissatisfaction. After the engagement at Lowestoft there awakened in me a burning desire to find myself with our proud *Derfflinger* facing an equally good English battle cruiser. This ambition remained with me day and night. I pictured to myself how we on our outposts or scouting cruises would suddenly come upon an English battle cruiser which the *Derfflinger* would engage in battle; and how a gigantic gun duel would be developed at high speed; how each salvo of the enemy would be answered by one from us; how we would fight more and more doggedly, like two powerful warriors who knew one of us would be left on the battle field.

In my dreams I saw the English gunnery officer with his periscope trained on our ship; I heard his English commands, I heard my own orders. The thought of such a battle between giant ships intoxicated me; my fancy painted it as a stupendous event. I had always regarded our firing exercises in a sporting spirit and endeavored, so far as possible, to fill the officers and gunners with sporting zeal. Even in peace the keenest competition existed between the ships of the different squadrons when endeavoring to land as many shots as possible at long range on one of our old and obsolete battleships anchored in shallow water off Kiel Bay as a so-called target ship. Or when, at night, we fired against the low dark-colored targets which were towed to represent torpedo boats, many a time an entire squadron bombarding simultaneously a whole squadron of targets, each ship having its own target, the greatest rivalry existed between the different gunnery officers to prove which ship was the best shot. This sporting spirit less often came to light in the war, and I missed it sorely. How I dreamed of an athletic contest of a gigantic character which I failed even to imagine. With like weapons we would meet the opponent, and then would be decided which side understood its business the better, who had the better nerves, and who the better weapons. So eagerly did I long for such a battle that the thought of the danger to life involved thereby seemed almost a secondary condition. Such a battle would have been for us an awakening out of the lethargy which threatened to engulf us sailors in consequence of the inactivity of our fleet as compared with the heroic deeds of our Army.

CHAPTER III.

Tactical principles underlying battle at sea.

A few days ago I was asked by a captain in active service in the army "Do ships really anchor for a sea engagement, or do they remain under way?" By other men also, who were otherwise well informed concerning military matters, I have often been assured that they had not the slightest idea of naval tactics. Inasmuch as I am writing this little book not only for my comrades at arms but primarily for the widest possible circle of German youth, who, more's the pity, have apparently grown up with an absurdly meager understanding of things pertaining to seamanship, especially in so far as this understanding is to be obtained on the high seas, I should like to say a few things here as to how ships are handled in the presence of the enemy. Naturally, under no circumstances, do the ships anchor at a certain distance from each other and then begin their gunnery duel. On the contrary, one can readily imagine that during a naval battle each ship runs at the very highest speed she is capable of attaining. A naval battle can scarcely be compared with any form of land warfare. Battles in the air between two squadrons of airplanes make the nearest approach to it. Perhaps in a future war types of battles will be developed which are not altogether unlike a naval battle. For example, if masses of enormous, heavily armored tanks, moving with the speed of racing autos, should fall upon each other to secure by maneuvering the best tactical position and finally open a bitter gunnery and air torpedo duel at long and short ranges to obtain a decision.

"Battle speed" for a ship is equivalent to "maximum speed." One reason for this is that in the enormous expanse of water represented by the open sea, advantageous tactical positions exist which each of the two opponents seeks to secure before true battle contact is established and the gunnery duel begins, and which each side will endeavor to secure during the battle and to retain. The decisive factors in the value of a position are the direction of the wind, the position of the sun, the character of the sea, and visibility. It is disadvantageous if the smoke clouds from one's own guns remain in front of the guns; that is to say when they cling to the ship or drift toward the hostile line. It is also disadvantageous for the sun to stand behind the enemy, as the gun pointer will then be blinded and the contour of the enemy ships will stand out much less sharply. It is likewise disadvantageous to fire directly into a high or rolling sea, as the guns will often be covered with spray which will disturb the gun pointer at his telescope, and also a gun crew. Finally, visibility and the conditions of the light may have a decisive effect, as they may vary so much in the different quarters

of the heavens that it may happen that one can see the enemy ship perfectly well while one's own ship is wholly invisible to the enemy, as if protected by a sorcerer's cap.

Aside from these in a certain sense local tactical advantages, there is a true tactical advantage resulting from the position of the ships with respect to each other. For example, if a ship lies directly across the bow of an enemy ship, she can bring all her broadside guns to bear directly on the enemy, and, with a modern ship this represents all her main battery and half her secondary battery. On the other hand, the ship, having the enemy athwart her bow, can train only two heavy turrets against the enemy. Both broadsides of the secondary battery and half the main battery drop out. Each ship therefore, makes every effort never to get into the so-called "T" position in which the advantage falls to the side which occupies a position corresponding to the cross of the "T." "Crossing the T" is the English way of expressing it. Entire squadrons and fleets may get into such a "T" position. It is always the purpose of the fastest ship to take up a position ahead of the enemy line in order to enfilade him; that is, to sweep his line lengthwise, or at least to force him to turn out. The more forcibly the head of the fleet is made to turn out, the more circular will be the formation gradually assumed by the fleet. The circle will become constantly smaller and finally the fleet finds itself "in the soup," as it were. This naturally can happen to a fleet only when it is quite inferior in speed or when surprised by the sudden appearance of unexpected enemy forces on the same course. That is what has happened to us in the battle of the Skagerrak.

Our fleet finally got into the very center of a semicircle of enemy ships and would have been exposed to the murderous fire of the entire hostile fleet and quickly deprived of any possibility of mobility had it not been—but I will not anticipate. No one will know what that means unless he has been plunged into the thick of battle. Perhaps I will be permitted to explain a few somewhat tactical expressions: "Line ahead" means a line of vessels one behind the [other column]. If the ships move up alongside each other they form "line abreast." If they travel in a diagonal line, they form an "echelon." When cruising, a fleet usually travels in line ahead or column, and it is then customary to place the strongest squadron at the head and the weakest at the rear. In cruising, the battle cruisers precede the battleship squadrons and also travel in column. In front of the armored cruisers the small cruisers form a scouting line. The cruising speed is usually not more than 15 to 17 knots. The ships, however, have steam up in all boilers so that they can immediately pass to full speed if the enemy is sighted.

How does a fleet proceeding against the enemy of whose approximate position it is kept informed by its scouting ships but of whose exact formation it has no knowledge, protect itself from crossing the "T" [being capped]? There is a very simple rule for this: One's own fleet is maintained in column formation at right angles to the direction in which the center of the enemy is supposed to lie, and thus the center of one's own line is brought opposite the center of the enemy line. In this way the enemy is "caught by the middle." This means the enemy is approached in an extended formation at full speed. In doing this the squadrons move in line abreast or in short columns consisting of four ships at the most. As soon as it is known whether the enemy has deployed to the right or to the left the whole line is turned into approximately the same course as that steered by the enemy, and sending out the fastest battle cruisers endeavors by forging ahead at full speed to pass in column across the head of the enemy. The faster fleet will always have the advantage in this encircling maneuver. If the fleets in the course of the battle approach each other to short ranges, by which I mean ranges of less than 1,000 meters, the fleet farther ahead has the additional advantage of being able to use her torpedoes sooner than the fleet standing farther to the rear. The fleet at the rear, as it were, runs into the torpedo fire from the ships ahead, while the fleet in the lead flees from those fired by the rear fleet * * *. For this reason a ship occupying a forward position and possessing torpedoes of a 10,000-meter run can fire her torpedoes when the enemy is still at a distance of 12,000 or more meters, while a ship standing farther to the rear must approach to 8,000 and less meters before she can fire her torpedoes. Torpedoes can not be used, however, except at short ranges, and the English knowing the danger from torpedoes and the good power of penetration of our shells always tried to avoid this. Owing to the high speed which all the English ships possessed in comparison with German ships of similar type, they were unfortunately always in a position to keep themselves at the desired distance from us. Long and painstaking maneuvers are necessary in order to secure a favorable position as regards wind, sea, and sun, in which again the faster fleet always has a great advantage. Thus the English by their superior speed were able during the battle of the Skagerrak to gradually change their initially unfavorable position as regards wind for a better one, which also afforded them the advantage of better conditions of light.

I bring this chapter to a close as I believe that I have explained the tactical principles necessary for an understanding of the great battle which we call the battle of the Skagerrak and which the English call the battle of Jutland.

COMPARATIVE NAVAL STRENGTH OF JAPAN, UNITED STATES, AND GREAT BRITAIN, MAY 1, 1920.

Source: Reliable.

The following definitions of classes of ships have been observed in the tables:

Battleships, modern.—Those having 13.5-inch guns or greater.
Battle cruisers, modern.—Combine 13.5-inch guns or greater with speed of 28 knots or greater.
Light cruisers, modern.—Combine 6-inch guns or larger with speed of 25 knots or greater.
Flotilla leaders.—Combine a displacement of 1,600 tons or greater with a speed of 30 knots or faster.
Destroyers, modern.—Not less than 835 tons displacement.
Submarines, modern.—Of late date, with good sea keeping qualities.

Other types of vessels have little fighting value and on account of the cost of upkeep will be gradually eliminated from the Navy lists. This has been done to a great extent by Great Britain at the present time, all 12-inch gun dreadnaughts and battle cruisers being listed for disposal. United States and Japanese 12-inch gun dreadnaughts will probably be retained on the list for a considerable period.

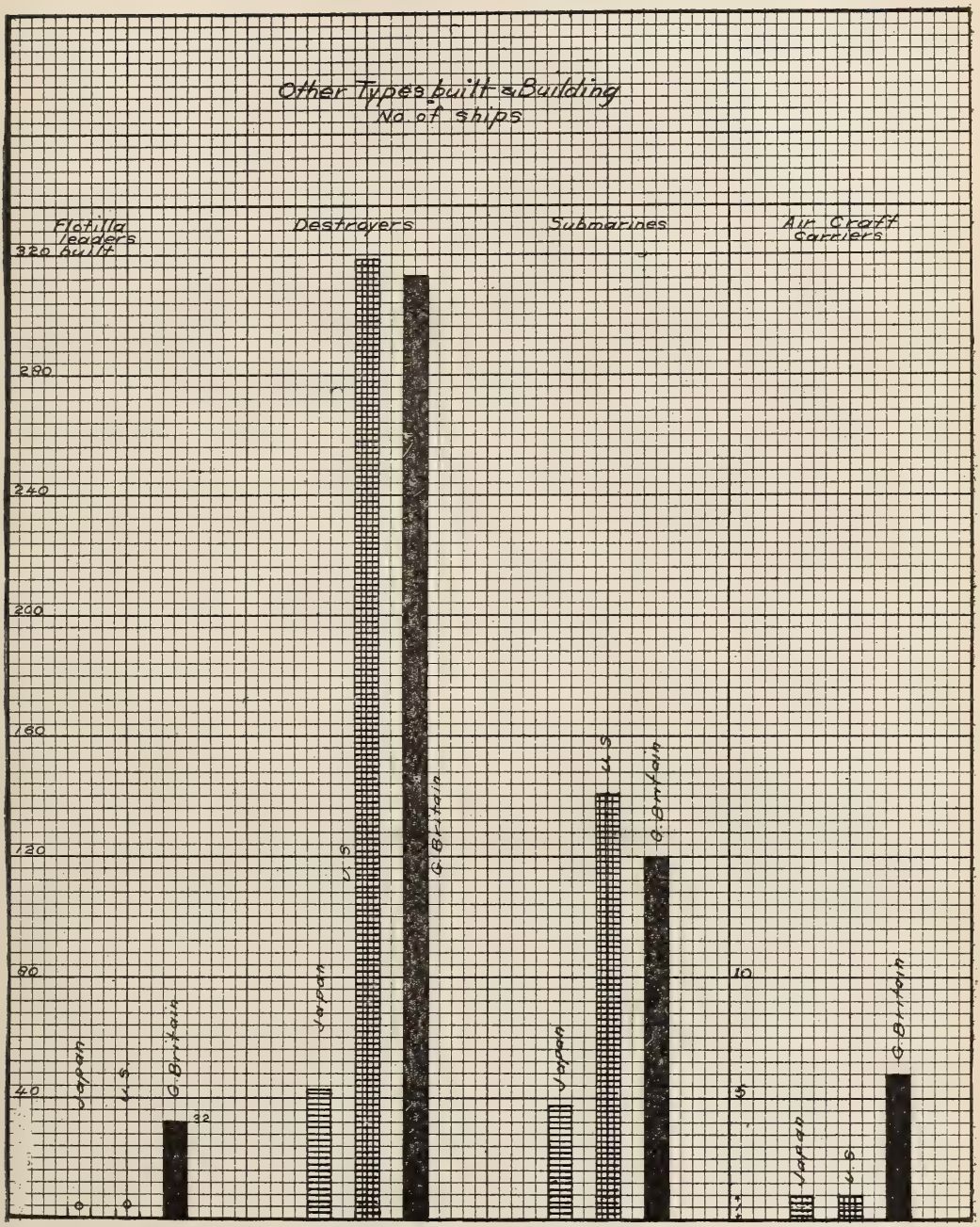
Such obsolete vessels as are available in time of war will be used for protection of lines of communication, coastal defense, and training purposes.

Japan.

MODERN BATTLESHIPS.

BUILT.

Name.	Completed.	Displacement.	Speed.	Battery.	Remarks.
Hyuga	1918	31,260	23	12, 14-inch	
Ise	1917	31,260	23	12, 14-inch	
Yamashiro	1917	30,600	23	12, 14-inch	
Fuso	1915	30,600	23	12, 14-inch	
BUILDING.					
Nagato	1920	40,600	23	8, 16-inch	Launched Nov. 9, 1919
Mutsu	1921	40,600	23	8, 16-inch	Launched May, 1920.
Kaga	1923	40,600	23	8, 16-inch	
Tosa	1923	40,600	23	8, 16-inch	Keel laid Feb. 16, 1920.
PROJECTED.					
A	1927	(?)	.....	(?)	
B	1927	(?)	.....	(?)	
C	1927	(?)	.....	(?)	
D	1927	(?)	.....	(?)	


Other Types built & Building
No. of ships
Flotilla leaders
320 built
Destroyers
Submarines
Air Craft Carriers
280
240
200
160
120
80
40
0
Japan
U.S
G.Britain
32
Japan
U.S
G.Britain
Japan
U.S
G.Britain
10
5
Japan
U.S
G.Britain

Japan—Continued.

OBSOLETE BATTLESHIPS.

Name.	Completed.	Displacement.	Speed.	Battery.	Remarks.
Settsu	1912	20,800	20.5	12, 12-inch	Only 8, 12-inch bear on broadside.
Aki	1910	19,800	20.2	4, 12-inch; 12, 10-inch.	
Satsuma	1910	19,350	18.9	4, 12-inch; 12, 10-inch.	
Katori	1906	15,950	19.3	4, 12-inch; 4, 10-inch.	
Kashima	1906	16,400	19.2	4, 12-inch; 4, 10-inch.	
Ibuki	1910	14,600	21.0	4, 12-inch; 8, 8-inch.	
Kurami	1909	14,600	21.0	do	
Ikoma	1908	13,750	21.9	4, 12-inch	
Mikasa	1901	15,300	17.6	do	
Asahi	1900	14,700	18.3	do	
Shikishima	1900	14,600	18.6	do	
Hizen	1902	12,700	18.0	do	

MODERN BATTLE CRUISERS.

BUILT.

Kongo	1913	27,500	27.5	8, 14-inch	
Hi-Yei	1914	27,500	27.5.	do	
Kirishima	1915	27,500	27.5	do	
Haruna	1915	27,500	27.5	do	

BUILDING.

Akagi	1923	40,000	30	8, 18-inch	Building, Kure; begun July, 1920.
Amagi	1923	40,000	30	do	Building, Yokosuka.
Atagi	1923	40,000	30 (?)	8, 18-inch (?)	Building, Kobe (?).
Ataka	1923	40,000	30 (?)	do (?)	Building, Nagasaki (?).

PROJECTED.

A	1927				
B	1927				
C	1927				
D	1927				

Japan—Continued.

MODERN LIGHT CRUISERS.

BUILT.

Name.	Completed.	Displacement.	Speed.	Battery.	Remarks.
Tenriju	1919	3,500	33	4, 5.5-inch	Built, Yokosuka.
Tatsuta	1919	3,500	33	do	Built, Sasebo.
Yahagi	1912	4,950	26.8	8, 6-inch	
Hirado	1912	4,950	26	do	
Chikuma	1912	4,950	26.8	do	
Kuma	1920	5,500	33	7, 5.6-inch	Report, W–96–1919.
Tama	1920	5,500	33	do	Launched, Feb. 10, 1920.

BUILDING.

Harima	(?)	(?)			Building, Sasebo.
Kitagami	1922	5,500	33	7, 5.6-inch	Building, Sasebo; begun Sept., 1919.
Oi		5,580	33	do	Building, Kobe.
Nagara		(?)			Building, Sasebo.
Isuzu		(?)			Building, Uraga.
Natori		(?)			Building, Kobe.
Kiso		5,500	33	7, 5.6-inch	Building, Nagasaki.

PROJECTED.

[To be completed by 1927.]

Twelve cruisers (number uncertain).

OBSOLETE CRUISERS.

Tone.
Tsushima.
Niitaka.
Tsugaru.
Chitose.
Suma.
Akashi.
Akitsushima.
Itsukushima.
Hashidate.
Chiyoda.
Kaiserin Elizabeth (ex-Austrian).

MODERN DESTROYERS.

Built:
- Kawakaze.
- Amatsukaze—
  - Isokaze.
  - Hamakaze.
  - Tanakaze.
  - Minekaze.
  - Sawakaze.
- Momo—
  - Enoki.
  - Nara.
  - Kuwa.
  - Tsubaki.
  - Maki.
  - Keyaki.
  - Yanagi.
  - Kashi.
  - Hinoki.

Built—Continued.
- Umikaze—
  - Yamakaze.
- Urukaze.
- Okikaze—
  - Shimakaze.
  - Yakaze.
- Momi—
  - Kaya.
  - Nire.
  - Kuri.
  - Nashi.
  - Take.
  - Kaki.

Building:
- Okikaze—
  - Nadakaze.
  - Kakaze.

Building—Continued.
- Momi—
  - Tsuga.
  - Shiokaze.
  - Hokaze.
  - Susuiri.
  - Akikaze.
  - Hiku.
  - Fuji.
  - Yukaze.
  - Aoi.
  - Tacnikaze.
  - Hagi.

Projected:
- Probably 32, names not known.
- To be completed 1927.

OBSOLETE DESTROYERS.

Fifty small obsolete destroyers.

SUBMARINES.

Built:	Building:	Building—Continued.
No. 15.	No. 21.	No. 36.
No. 16.	No. 22.	No. 37.
No. 17.	No. 23.	No. 38.
No. 18.	No. 25.	No. 39.
No. 19.	No. 26.	No. 40.
No. 20.	No. 27.	No. 41.
No. 24.	No. 28.	No. 42.
U–46.[1]	No. 29.	No. 43.
U–55.[1]	No. 30.	Projected:
U–90.[1]	No. 31.	Uncertain; probably 28.
U–99.[1]	No. 32.	
U–125.[1]	No. 33.	
U. B. 125.	No. 34.	
U. B. 143.	No. 35.	

Also 13 obsolete submarines Nos. 1–13.

Great Britain.

MODERN BATTLESHIPS.

BUILT.

Name.	Completed.	Displacement.	Speed.	Battery.	Remarks.
Royal Sovereign	1916	25,750	23	8, 15-inch	
Royal Oak	1916	25,750	23	do	
Revenge	1916	25,750	23	do	
Resolution	1916	25,750	23	do	
Ramillies	1917	25,750	23	do	
Canada	1915	28,000	22.7	10, 14-inch	Ex Almirante Latore; to be returned to Chile.
Malaya	1916	27,500	25	8, 15-inch	
Valiant	1916	27,500	25	do	
Barham	1915	27,500	25	do	
Queen Elizabeth	1915	27,500	25	do	
Warspite	1915	27,500	25	do	
Erin	1914	23,000	21	10, 13.5-inch	
Agincourt	1914	27,500	22	14, 12-inch	To be disposed of.
Benbow	1914	25,000	21	10, 13.5-inch	
Emperor of India	1914	25,000	21	do	
Marlborough	1914	25,000	21	do	
Iron Duke	1914	25,000	21	do	
Ajax	1913	23,000	21	do	
Centurion	1913	23,000	21	do	
King George V	1912	23,000	21	do	
Conqueror	1912	22,500	21	do	
Monarch	1912	22,500	21	do	
Thunderer	1912	22,500	21	do	
Orion	1912	22,500	21	do	

[1] Ex-German submarines.

Great Britain—Continued.

BUILDING AND PROJECTED.

None.

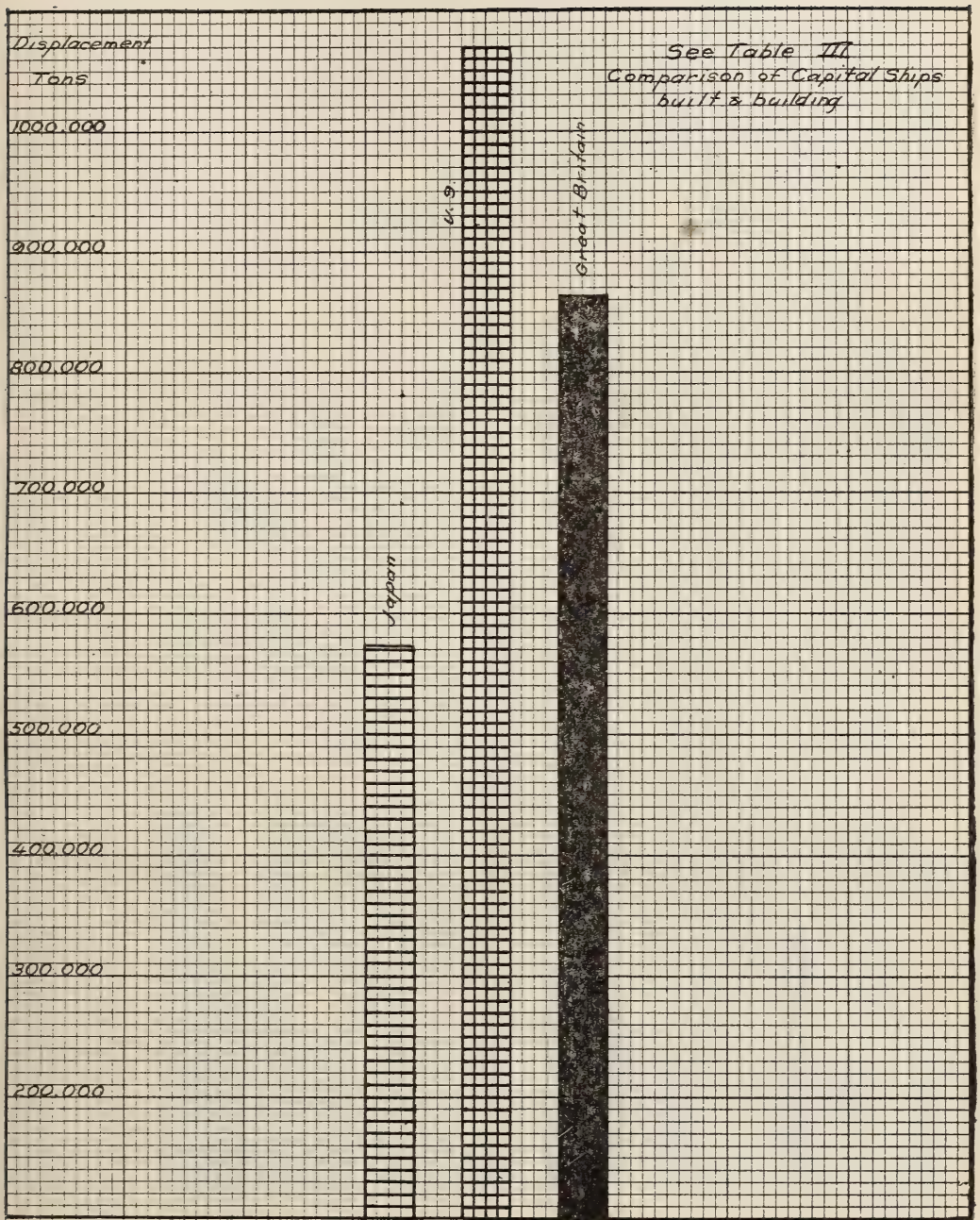
OBSOLETE BATTLESHIPS.

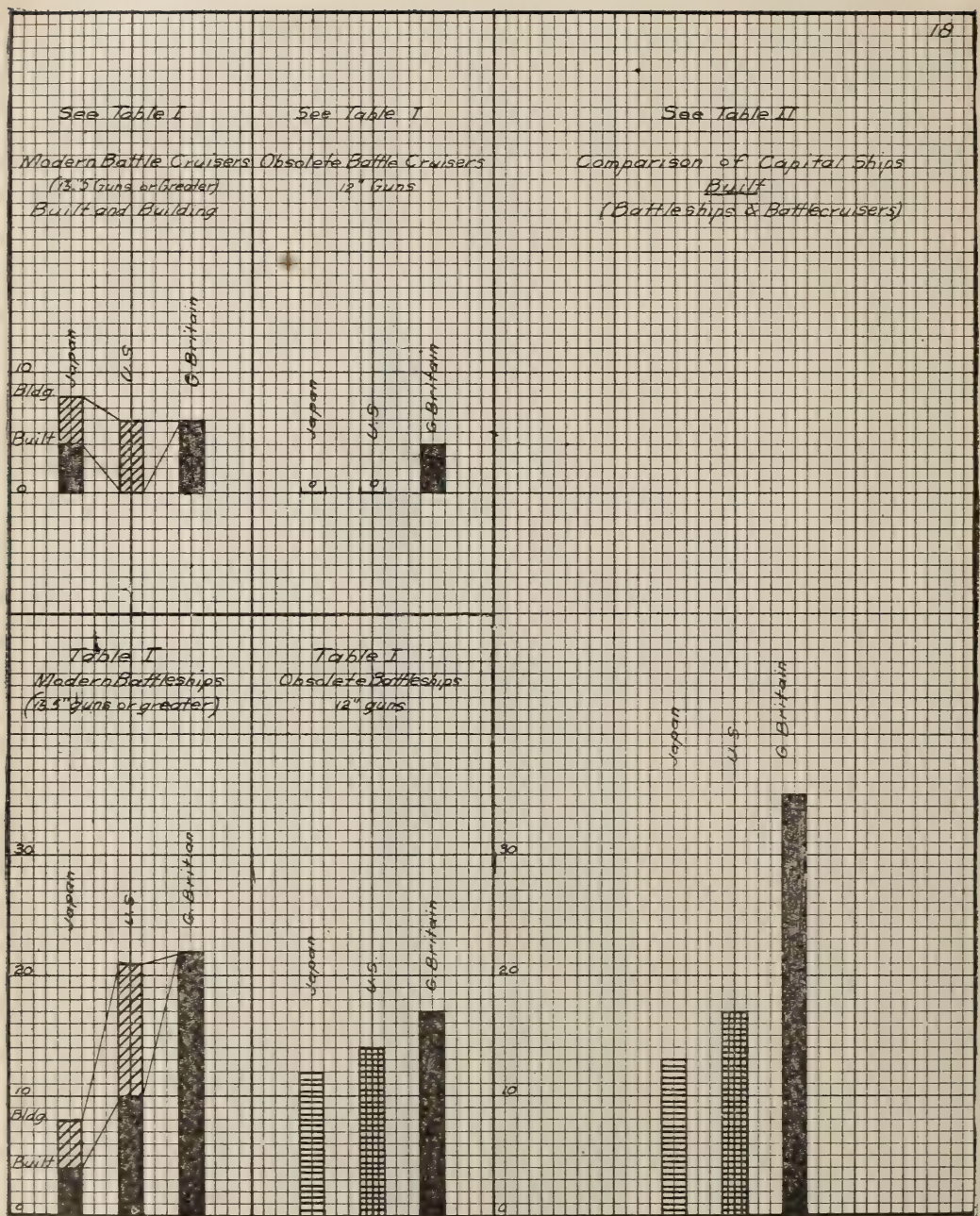
Name.	Completed.	Displacement.	Speed.	Battery.	Remarks.
Colossus	1911	20,000	21	10, 12-inch	Included in post war fleet.
Hercules	1911	20,000	21	do	Do.
Neptune	1911	19,900	21	do	Do.
Collingwood	1910	19,250	21	do	Do.
St. Vincent	1909	19,250	21	do	Do.
Superb	1909	18,600	21	do	To be disposed of.
Temeraire	1909	18,600	21	do	Do.
Bellerophon	1909	18,600	21	do	Do.
Dreadnaught	1906	17,900	21	do	Do.
Lord Nelson	1908	16,500	18.5	4, 12-inch; 10, 9.2-inch.	
Agamemnon	1908	16,500	18.5	do	
Hibernia	1906	16,350	18.5	4, 12-inch; 4, 9.2-inch.	
Africa	1906	16,350	18.5	do	
Zealandia	1905	16,350	18.5	do	
Hindustan	1905	16,350	18.5	do	
Dominion	1905	16,350	18.5	do	
Commonwealth	1905	16,350	18.5	do	
And others.					

Extract from the Naval and Military Record (British) of March 3, 1920.

Dreadnaughts for Sale.

Great Britain.—Following the announcement in these columns a few months ago that several of our earlier dreadnaughts were to be disposed of, The Naval and Military Record was lectured by a contemporary for publishing inaccurate news. Our announcement, however, was quite correct. As early as last July the *Bellerophon, Superb, Indomitable,* and *Inflexible* were earmarked for early disposal, though the Admiralty for some reason held back the official statement which was to have been issued. Now that the impending fate of these four ships has been confirmed, we are in a position to add that a further group of dreadnaughts, comprising the *St. Vincent, Collingwood, Neptune, Hercules,* and *Colossus,* will shortly be discarded. All the vessels named are armed with 12-inch guns, which are no longer considered equal to tactical requirements. The survival of the dreadnaught herself, when later ships are being labeled for the ship breaker, has given rise to some comment. This vessel is of stouter construction than her successors, and her boilers and machinery are in excellent condition after 14 years of service. It is probable that she will be retained on the Navy list for some years longer in a subsidiary capacity.


Displacement
Tons
1000.000
900.000
800.000
700.000
600.000
500.000
400.000
300.000
200.000
U. S.
Great Britain
Japan
See Table III
Comparison of Capital Ships
built & building


See Table I
Modern Battle Cruisers
(13.5 Guns or Greater)
Built and Building
10
Bldg.
Built
0
Japan
U.S.
G. Britain
See Table I
Obsolete Battle Cruisers
12" Guns
Japan
U.S.
G. Britain
0
See Table II
Comparison of Capital Ships
Built
(Battleships & Battlecruisers)
Japan
U.S.
G. Britain
30
20
10
0
Table I
Modern Battleships
(13.5" guns or greater)
30
20
10
Bldg.
Built
0
Japan
U.S.
G. Britain
Table I
Obsolete Battleships
12" guns
Japan
U.S.
G. Britain
30
20
10
0

Of the three *Bellerophons*, the *Temeraire* is being employed as a training ship for cadets and is said to have proved very successful in this rôle. The *St. Vincent* and *Collingwood*, launched in 1908, have never been thoroughly satisfactory ships, owing, it is said, to their light construction and inadequate protection. Moreover, the tendency of their long 12-inch guns to droop at the muzzle has always been a source of trouble. The *Neptune*, *Hercules*, and *Colossus*, although they carry the same armament of ten 12-inch, have a nominal superiority in fighting value, as their echeloned turrets enable them to use all 10 guns on either beam, through a limited arc of training. In practice, however, full broadsides have been rarely fired, as the blast of the wing turret guns firing across the deck is apt to cause serious damage.

A Proof of Confidence.

The fact that nine of our dreadnaughts are to be disposed of indicates the Government's confidence in the tranquillity of the political situation abroad. A very few years ago these nine ships formed the backbone of the Navy, and all through the war they constituted an important section of the Grand Fleet. They are but little if at all inferior to the 12-inch-gun battleships in the navies of the United States and Japan, and it goes without saying that if there existed the faintest possibility of friction with either power we should not be laying aside such valuable ships. Before deciding to get rid of these vessels the Admiralty no doubt considered the alternative of paying them off and keeping them in reserve. But experience has shown that ships out of commission deteriorate very rapidly, and in the circumstances it is probably the wisest course to let them go under the hammer.

Another vessel which is considered to have outlived her usefulness is the *Agincourt* the battleship expropriated from Turkey at the beginning of the war. She has always been something of a misfit in the navy, though her battery of fourteen 12-inch guns made her a useful acquisition for service against the Germans. Finally there is the *New Zealand*, the battle cruiser which lately returned from her tour of the dominions with Lord Jellicoe. Like the *Indomitable* and *Inflexible* she is not up to the ultra-modern standards of speed, armament, and protection, and is thus denied a place in the postwar fleet. The suggestion that she should be maintained in commission by the dominion whose name she bears does not appear to have commended itself to the New Zealand authorities.

Extract from the Naval and Military Record of March 31, 1920.

An announcement relating to the reduction of the fleet was made by Mr. Long, First Lord of the Admiralty, in the House of Commons on Wednesday, when he informed Commodore Viscount Curzon

that the following ships of the all-big-gun type were not required for the postwar fleet, but the method of their disposal was not yet settled: *Agincourt*, *Bellerophon*, *Dreadnought*, *Superb*, *Inflexible*, and *Indomitable*. The remainder were all included in the postwar fleet. This decision has not been considered by the committee of imperial defense.

MODERN BATTLE CRUISERS.

BUILT.

Name.	Completed.	Displacement.	Speed.	Battery.	Remarks.
Hood	1920	41,200	32	8, 15-inch	
Renown	1916	26,500	32.6	6, 15-inch	
Repulse	1916	26,500	31.7	do	
Tiger	1914	28,500	30	8, 13.5-inch	
Princess Royal	1912	26,350	28	do	
Lion	1912	26,350	28	do	

None building or projected.

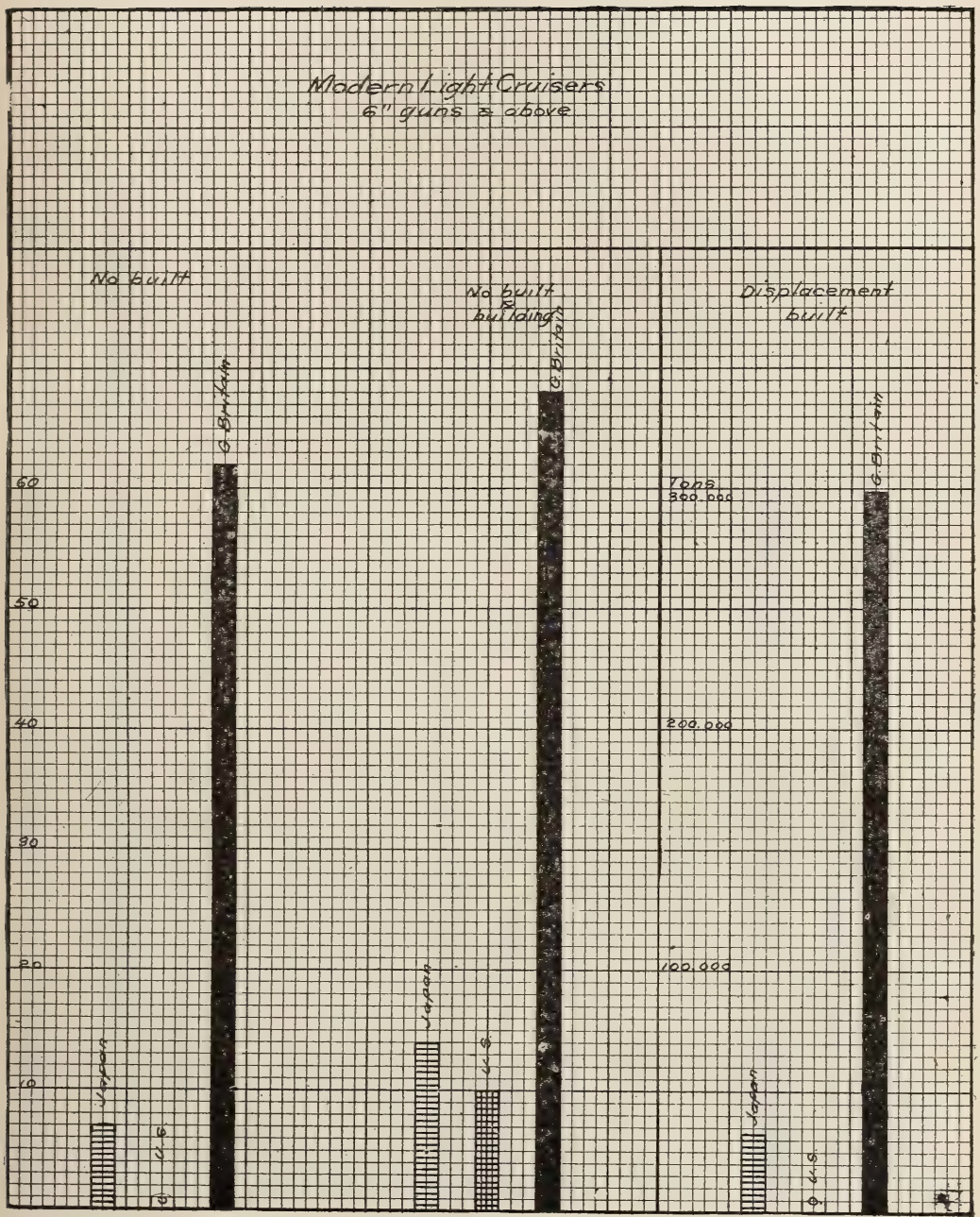
Following obsolete battle cruisers to be disposed of:

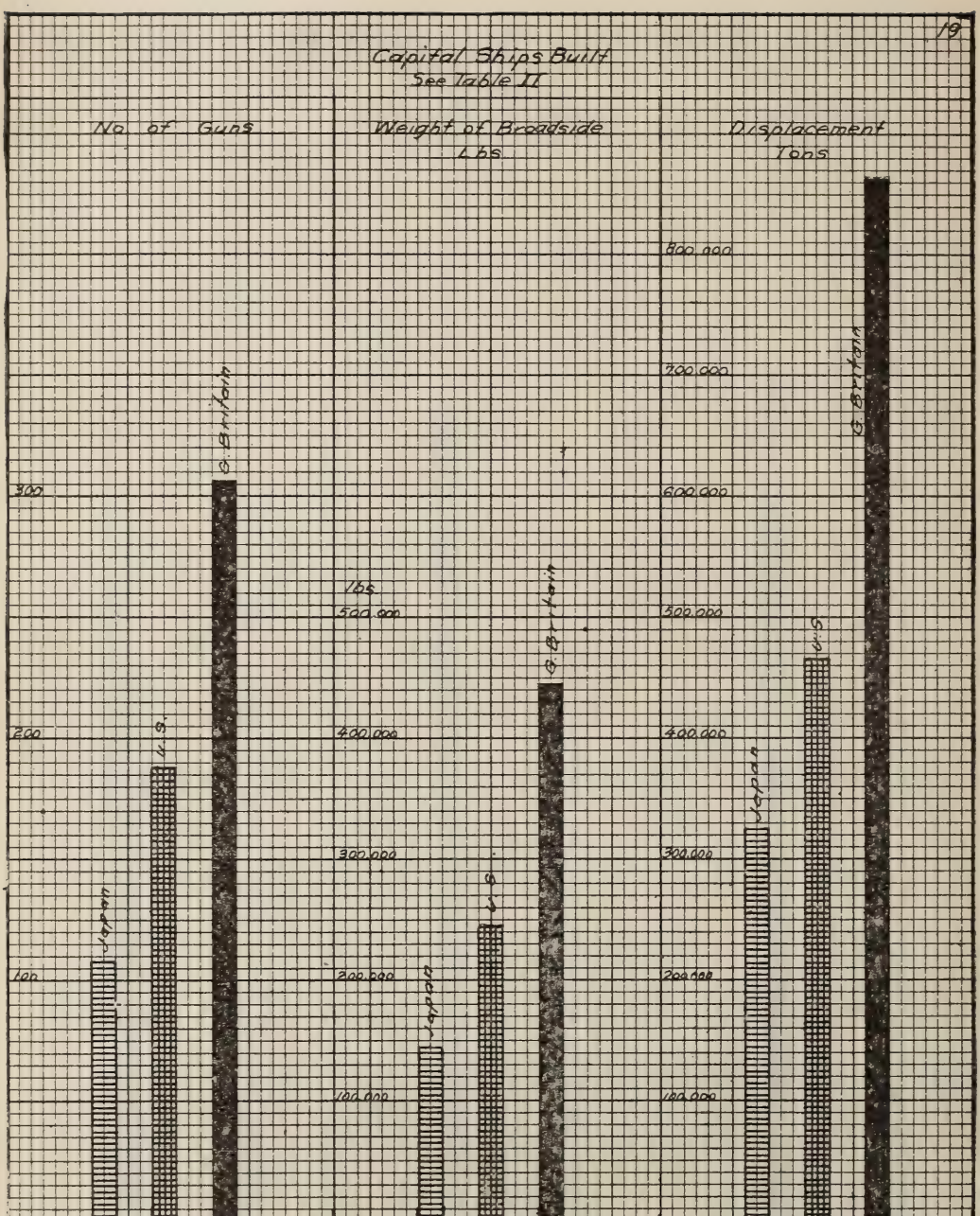
Name.	Completed.	Displacement.	Speed.	Battery.	Remarks.
Inflexible	1908	17,250	25	8, 12-inch	
Indomitable	1908	17,250	25	do	

Following obsolete battle cruisers, disposition uncertain (may be maintained by the Dominions):

Name.	Completed.	Displacement.	Speed.	Battery.	Remarks.
New Zealand	1912	18,800	25	8, 12-inch	
Australia	1913	18,800	25	do	

NOTE.—The *Courageous* and *Glorious*, while having the speed and guns of battle cruisers, are not listed in this class, as they were on special duty in the war and did not operate with the fleet. They can not be classed as obsolete, although it is doubtful that they will ever cruise with the fleet.


Modern Light Cruisers
6" guns & above
No built
No built & building
Displacement built
G. Britain
U.S.
Japan
60
50
40
30
20
10
Tons
300,000
200,000
100,000


19
Capital Ships Built
See Table II
No. of Guns
Weight of Broadside
Lbs
Displacement
Tons
300
200
100
Japan
U.S.
G. Britain
lbs
500,000
400,000
300,000
200,000
100,000
Japan
U.S.
G. Britain
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
Japan
U.S.
G. Britain

MODERN LIGHT CRUISERS.

Name.	Completed.	Displacement.	Speed.	Battery.	Remarks.
Hawkins	1919	9,750	30	7, 7.5-inch	
Frobisher	1921	9,750	30	do	Building.
Effingham	1921	9,750	30	do	Do.
Raleigh	1921	9,750	30	do	Do.
Dunedin	1920	4,650	29	6, 6-inch	
Durban	1920	4,650	29	do	
Diomede	1920	4,765	29	do	
Despatch	1920	4,765	29	do	
Danae	1918	4,650	29	do	
Dauntless	1918	4,650	29	do	
Dragon	1918	4,650	29	do	
Cairo	1919	4,190	29	5, 6-inch	
Capetown	1919	4,190	29	do	
Calcutta	1919	4,190	29	do	
Cardiff	1917	4,190	29	do	
Coventry	1918	4,190	29	do	
Curlew	1917	4,190	29	do	
Ceres	1917	4,190	29	do	
Carlisle	1918	4,190	29	do	
Curacoa	1918	4,190	29	do	
Caledon	1917	4,120	29	do	
Calypso	1917	4,120	29	do	
Caradoc	1917	4,120	29	do	
Concord	1916	3,750	28.5	do	
Centaur	1916	3,750	28.5	do	
Cambrian	1916	3,750	28.5	3, 6-inch	
Canterbury	1916	3,750	28.5	4, 6-inch	
Constance	1916	3,750	28.5	do	
Castor	1915	3,750	28.5	do	
Chester	1916	5,185	26	10, 5.5-inch	
Berkenhead	1915	5,235	26	do	
Champion	1915	3,750	28.5	4, 6-inch	
Calliope	1915	3,750	28.5	do	
Comus	1915	3,750	28.5	3, 6-inch	
Conquest	1915	3,750	28.5	4, 6-inch	
Carysfort	1915	3,750	28.5	do	
Cordelia	1915	3,750	28.5	do	
Caroline	1914	3,750	28.5	do	
Cleopatra	1915	3,750	28.5	do	
Royalist	1915	3,500	28.5	3, 6-inch; 4, 4-inch	
Inconstant	1915	3,500	28.5	do	
Phaeton	1915	3,500	28.5	do	
Aurora	1914	3,500	28.5	2, 6-inch; 6, 4-inch	
Galatea	1914	3,500	28.5	3, 6-inch; 4, 4-inch	
Undaunted	1914	3,500	28.5	2, 6-inch; 6, 4-inch	
Penelope	1914	3,500	28.5	3, 6-inch; 4, 4-inch	
Bermingham	1914	5,440	25.5	9, 6-inch	
Lowestoft	1914	5,440	25.5	do	
Southampton	1912	5,400	25.5	8, 6-inch	
Dublin	1913	5,400	25.5	do	
Chatham	1912	5,400	25.5	do	
Yarmouth	1912	5,250	25	do	
Dartmouth	1911	5,250	25	do	
Weymouth	1911	5,250	25	do	
Bristol	1910	4,800	25	2, 6-inch; 10, 4-inch	
Newcastle	1910	4,800	25	do	
Liverpool	1910	4,800	25	do	
Gloucester	1910	4,800	25	do	
Glasgow	1910	4,800	25	do	
Euphrates	1920	7,650	.....	.....	Not launched.
Enterprise	1920	7,650	.....	.....	Building.

MODERN LIGHT CRUISERS—Continued.

Name.	Completed.	Displacement.	Speed.	Battery.	Remarks.
Emerald	1920	7,650	.....	.....	Not launched.
Melbourne	1913	5,400	25.5	8, 6-inch	Assigned Australia.
Sydney	1913	5,400	25.5	.....do	Do.
Brisbane	1916	5,400	25.5	.....do	Do.
Adelaide	1919	5,400	25.5	8, 6-inch (?)	Do.
Delhi	1919	4,650	29	6, 6-inch	
Colombo	1919	4,190	29	5, 6-inch	

Total, 68.

There are also the following numbers of obsolete cruisers and light cruisers:
27 cruisers (Shannon, Country class, etc.).
34 light cruisers (Broadicea, Sentinel classes and earlier).
These vessels are being disposed of.

FLOTILLA LEADERS.

Built:
Campbell.
Montrose.
Stuart.
Bruce.
Douglass.
Shakespeare.
Spenser.
Marksman.
Anzac (assigned Australia).

Built—Continued.
Seymour.
Saumarez.
Parker.
Grenville.
Abdiel.
Gabriel.
Ithuriel.
Nimrod.
Kempenfelt.
Botha.

Built—Continued.
Faulknor.
Broke.
Swift.
Wallace.
Mackay.
Malcom.
Lightfoot.

Building:
Keppel.
Rooke.

The above vessels have the following characteristics:
Displacement, 1,600–1,800 tons.
Speed, 34–36.5 knots.
Battery, 4–4 inch to 5–4.7 inch.

MODERN DESTROYERS.

BUILT AND BUILDING.

Subsequent to "L" class	281
"L" class	19
"K" class	13
Total	313

OBSOLETE DESTROYERS.

"I" class	20	"C" class	27
"H" class	17	"B" class	18
"G" class	13	"A" class	8
"F" class	9	Parramatta	6
"E" class	27		
"D" class	7	Total	152

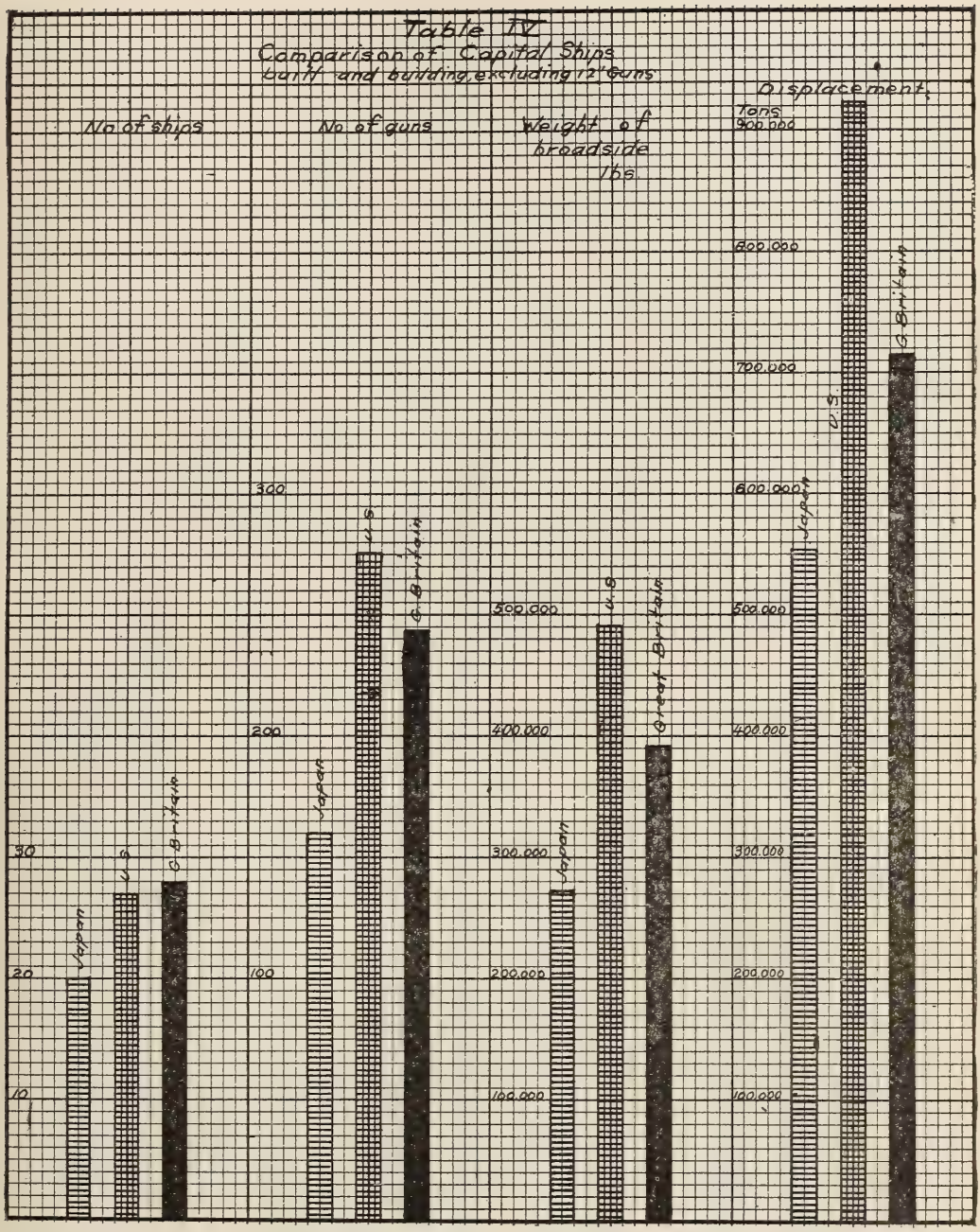
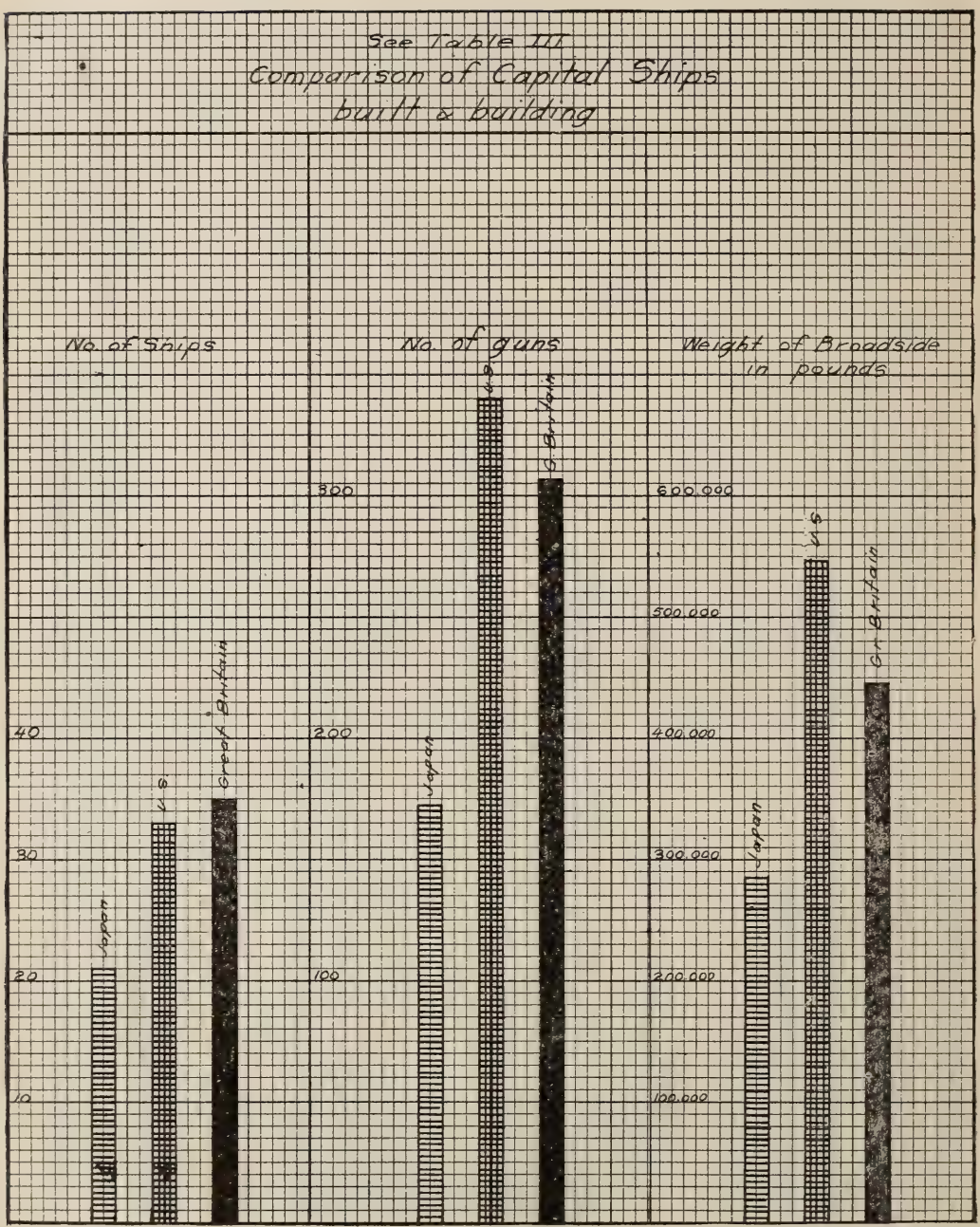


Table IV
Comparison of Capital Ships
Built and building, excluding 12" Guns
No of ships
No of guns
Weight of broadside lbs
Displacement. Tons
30
20
10
300
200
100
500,000
400,000
300,000
200,000
100,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
Japan
U.S.
G. Britain


See Table III
Comparison of Capital Ships
built & building
No. of Ships
No. of guns
Weight of Broadside
in pounds
40
30
20
10
300
200
100
600,000
500,000
400,000
300,000
200,000
100,000
Japan
U.S.
Great Britain
Japan
U.S.
G. Britain
Japan
U.S.
Gr. Britain

MODERN SUBMARINES.

"R" type	11	"V" type	4
"M" type	4	"H" type	30
"L" type	41	"G" type	10
"K" type	14		
"J" type	6	Total	120

AIRCRAFT CARRIERS.

Name.	Completed.	Displacement.	Speed.	
Furious	1917	19,100	31	10 planes.
Vindictive	1919	9,750	29.7	6 (?) planes.
Argus	1918	15,750	21	
Ark Royal	1914	7,450	11	
Hermes	1920	10,350	28 (?)	20 seaplanes.
Eagle	1920	28,000	24	Ex-Almirante Cochran.

There are also in the British Navy large numbers of the following types of craft:
Monitors.
Mine sweepers.
Sloops.
Patrol boats.
These craft are being gradually disposed of.

United States.

MODERN BATTLESHIPS.

BUILT AND BUILDING.

Name.	Completed.	Displacement.	Speed.	Battery.	Remarks.
Massachusetts	1924	43,200	23	12, 16-inch	Building.
Iowa	1924	43,200	23	do	Do.
North Carolina	1924	43,200	23	do	Do.
Montana	1924	43,200	23	do	Do.
Indiana	1924	43,200	23	do	Do.
South Dakota	1924	43,200	23	do	Do.
West Virginia	1923	32,600	21	8, 16-inch	Do.
Washington	1922	32,600	21	do	Do.
Maryland	1921	32,600	21	do	Do.
Colorado	1922	32,600	21	do	Do.
California	1920	32,300	21	12, 14-inch	Do.
Tennessee	1920	32,300	21	do	
Idaho	1919	32,000	21	do	
Mississippi	1917	32,000	21	do	
New Mexico	1918	32,000	21	do	
Arizona	1916	31,400	21	do	
Pennsylvania	1916	31,400	21	do	
Oklahoma	1916	27,500	21	10, 14-inch	
Nevada	1916	27,500	21	do	
Texas	1914	27,000	21	do	
New York	1914	27,000	21	do	

United States—Continued.

OBSOLETE BATTLESHIPS.

Name.	Completed.	Displacement.	Speed.	Battery.	Remarks.
Arkansas	1912	26,000	21	12, 12-inch	
Wyoming	1912	26,000	21	do	
Utah	1911	21,825	21	10, 12-inch	
Florida	1911	21,825	21	do	
North Dakota	1910	20,000	21	do	
Delaware	1910	20,000	21	do	
Michigan	1910	16,000	18	8, 12-inch	
South Carolina	1910	16,000	18	do	
New Hampshire	1908	16,000	18	4, 12-inch; 8, 8-inch	
Minnesota	1907	16,000	18	do	
Kansas	1907	16,000	18	do	
Vermont	1907	16,000	18	do	
Louisiana	1906	16,000	18	do	
Connecticut	1906	16,000	18	do	

And 13 others (Illinois to Virginia classes).

BATTLE CRUISERS.

BUILDING.

Lexington	1924	43,500	33.25	8, 16-inch	
Constellation	1924	43,500	33.25	do	
Saratoga	1924	43,500	33.25	do	
Ranger	1924	43,500	33.25	do	
Constitution	1924	43,500	33.25	do	
United States	1924	43,500	33.25	do	

LIGHT CRUISERS.

BUILDING.

10 building	1924	7,100	35	8, 6-inch	4 on broadside.

DESTROYERS.

BUILT AND BUILDING.

298 destroyers, 1,000–1,200 tons.
21 destroyers, 750 tons.

MODERN SUBMARINES.

BUILT AND BUILDING.

Fleet submarines	9	M class	1
AA's	3	L class	11
S class	51	K class	8
R class	27	H class	8
O class	16		
N class	7	Total	141

Of the above the H, K, L, M, and N classes (35 boats) are suitable only for coastal and short radius work.

There are also on the Navy List a number of the following:

Old cruisers of little military value.
Eagle boats.
Mine sweepers.

TABLE 1.—*Summary of ships built and building.*

	Japan.			United States.			Great Britain.		
	Built.	Building.	Total.	Built.	Building.	Total.	Built.	Building.	Total.
Modern battleships	4	4	8	10	11	21	22	.....	22
Obsolete battleships	12	.....	12	14	.....	14	17	.....	17
Modern battle cruisers	4	4	8	.....	6	6	6	.....	6
Obsolete battle cruisers	.....	.....	.....	.....	.....	.....	4	.....	4
Modern light cruisers	7	7	14	.....	10	10	62	6	68
Flotilla leaders	.....	.....	.....	.....	.....	.....	26	2	28
Destroyers	30	13	43	234	85	319	313	.....	313
Submarines	15	22	37	81	60	141	120	.....	120
Air craft carriers	1	?	1	.....	1	1	4	2	6

The above table does not include the Japanese vessels projected for construction between 1924 and 1927.

British modern battleships do not include *Canada* and *Agincourt*.

All obsolete British battleships of *Superb* class and below (12 in number) will be disposed of according to official statements. Of the British obsolete battle cruisers the *Inflexible* and *Indomitable* are to be disposed of. (Official.) The disposition of the *Australia* and *New Zealand* is uncertain.

TABLE 2.—*Comparison of capital ships built (battleships and battle cruisers).*

	Japan.	United States.	Great Britain.
Number of vessels	[1] 13	[2] 17	[3] 35
Number of guns	108	188	306
Weight of broadside.....pounds..	144, 360	237, 000	447, 980
Displacement.....tons..	326, 020	468, 000	864, 650

[1] Includes Japanese Kashima and above.
[2] Includes Delaware class and above to Tennessee and California.
[3] Includes British St. Vincent class and above (5–12″ gun battleships), also battle cruisers Australia and New Zealand (12″ gun ships). Others 13.5″ and above.

TABLE 3.—*Comparison of capital ships built and building.*

	Japan.	United States.	Great Britain.
Number of vessels	[1] 21	[2] 33	[3] 35
Number of guns	172	340	306
Weight of broadside.....pounds..	282, 760	548, 000	447, 980
Displacement.....tons..	576, 920	1, 069, 450	864, 650

[1] Includes Japanese Kashima and above.
[2] Includes Delaware and above.
[3] For British, same as Table 2.

TABLE 4.—*Comparison of capital ships built and building (excluding all 12-inch gun ships).*

	Japan.	United States.	Great Britain.
Number of vessels	20	27	28
Number of guns	160	276	244
Weight of broadside.....pounds..	272, 660	492, 000	394, 040
Displacement.....tons..	556, 120	933, 800	718, 650

This table gives the probable comparison of capital ships about 1924, assuming that all United States capital ships under construction are completed and that Great Britain does not begin a new program.

AN AUSTRALIAN NAVY URGED BY JELLICOE.

Source: The Japan Advertiser.

15 February 1920.

(12517-a)

The following résumé of Admiral Sir John Jellicoe's report on the naval needs of Australia is written by the Sydney correspondent of the London Times:

An Australian Navy, an imperial fleet for the Far East, and a new conception of British coordination in naval supremacy are all provided in Admiral of the Fleet Viscount Jellicoe's report to the Commonwealth Cabinet upon the sea defense of Australia.

Viscount Jellicoe has lucidly and forcibly described the true position of Australia for the first time. Sir Edmund Barton, first federal prime minister, was nearly turned out of office because he returned from his first imperial conference still pledged to find a subsidy for the British squadron in Australian waters. From that debate the idea of a local navy took definite shape. First it was to be a mosquito fleet of destroyers. Then a couple of fast light cruisers slid into the scheme, and finally a battleship appeared in the picture, until the Commonwealth became possessed of the nucleus of a navy. And now Viscount Jellicoe has declared that this island continent requires more warships and proper harbor defense, and should join with the mother country and the sister dominions and the Empire of India in upholding the white ensign in the Pacific, and, indeed, the Seven Seas. Viscount Jellicoe boldly and baldly states, "It must be recognized that Australia is powerless against a strong naval and military power without the assistance of the British fleet * * *."

The purely Australian section of the recommendations is not very formidable. It provides for little increase in the seagoing strength of the present navy. The ships imperatively required for overseas and harbor defense are set out as—

"It will be convenient for Australia to possess a basis on which to build up her fleet in the future. When the fleet attains any definite

strength that may be decided upon, the cost will then be limited to the sum required for its maintenance plus the amount required to replace ships as they become obsolete."

In order that the expansion of the fleet may proceed upon a regular system and that additions may be made with a definite object in view, it is proposed to divide the naval requirements of Australia under three headings, viz:

(*a*) Striking force.
(*b*) Direct defense of trade.
(*c*) Harbor defense.

(*a*) For the striking force certain classes of vessels are required, and they are needed in certain proportions one to the other. The basis taken in a fleet unit which, it is considered that war experience has shown, should comprise in the case of Australia—

One battle cruiser, two light cruisers, six destroyers, four submarines, and two fleet mine sweepers.

The units require certain auxiliary vessels in the following proportion:

For every 18 destroyers, 1 depot ship.
For every 9 destroyers, 1 flotilla leader.
For every 8 submarines, 1 depot ship.
For every 2 units, 1 aircraft carrier.
For every 8 units, 1 repair ship.
For every 16 units, 1 mine layer.

(*b*) For the direct defense of trade, Australia requires in the near future four light cruisers and eight armed escort ships, assuming that other portions of the Empire make provision on a similar scale.

(c) For harbor defense Australia requires immediately:

20 destroyers or "P" boats.
10 submarines.
82 mine sweepers (trawlers), of which 74 should be fishing trawlers.
4 boom defense vessels.

Interlocking Interests.

With them necessarily go naval bases and depots and all the essentials of sea power. Australians had vaguely realized that such things should be obtained, but they had not expected the dramatic stroke of sea strategy and statesmanship which insists that the Australian unit is only one faggot, and that unless other faggots are placed with it the bundle will not be big enough to withstand a possible enemy, while even when the faggots are carefully collected they will not be of satisfying strength unless bound by a common command.

Australians had rather come to regard Sydney as the hub of Commonwealth naval activities, and Viscount Jellicoe, surveying the

Pacific from China to Peru, has selected Singapore as the better naval base for the imperial fleet which he wishes to see in it. His reasons are best given in his own words:

Australia, in common with the rest of the Empire, is dependent on the security of her sea communications, but Australia is also faced with the problem of invasion, due to the attractions offered by the great potential value of the land and the very small population occupying it.

The difficulty of guarding Australia against invasion is greatly increased by the fact that the population of the Commonwealth is so small, by the absence of strategic railways, the immense length of coast line, and the great distance from the mother country with its naval and military support. Against these difficulties must be placed the advantage given by the distance of Australia from neighboring countries.

The final decision of war must in any case depend on the result in the main theater, wherever that may be; support to Australia would naturally be forthcoming if the international situation in other directions permitted. None the less, it is undoubtedly the case that great damage could be done to Australia under certain circumstances before the mother country could intervene.

A Question of Cooperation.

It is not possible to consider the naval requirements of Australia without taking account also of the naval requirements of the Pacific and Indian Oceans as a whole. The question is one of cooperation between the naval forces of the Empire stationed in far eastern waters. Sea communications in Indian and Chinese waters, as well as in the remainder of the Pacific, are matters of concern to the people of Australia and New Zealand; and, conversely, the safety of sea communications in the South Pacific and in China are of interest to the people of India. Similarly, the safety of the bases at Colombo and Singapore is vital to Australia and New Zealand; and the safety of Sydney and other naval bases in the South Pacific, and of Singapore and Colombo, is of greatest importance to India. Even the prosperity of South Africa is associated, though in a lesser degree, with this question, whilst Canada is greatly concerned in the matter.

It will be seen, therefore, that the far eastern naval problem is one which concerns the Empire as a whole.

Only one conclusion can be drawn, viz: That the Far Eastern Fleet should be provided by those constituent parts of the Empire, including Great Britain, for which it is of vital necessity, and that there should be the closest cooperation with unity of direction in war between the various squadrons composing that fleet.

I am of opinion that the general direction of the operations of the Far Eastern Fleet should be delegated by the Admiralty to a flag

officer of a high rank residing on shore at Singapore, and assisted by a strong staff. The commander in chief afloat and the flag officers commanding the units of the Far Eastern Fleet should all come under his command in war, although, except when placed under his command for the purposes of fleet exercises, the Dominion navies would not come under him in peace. The admiral in chief command at Singapore should visit such places in the Pacific and Indian Oceans as are of importance for naval purposes in war, in order that he may have a very intimate knowledge of the general situation. It would also be most desirable that he should visit the Dominions, so that he may become familiar with the problems which confront them. He should be assisted in his duties by information furnished to him by the naval board of Australia, and the naval authorities of other Dominions, should they follow Australia's example in regard to fleet units; and he should, of course, be in constant touch with the admiral and the officers commanding the British squadrons in China and the East Indies.

This expenditure—which, it is presumed, will be borne by Great Britain—will be a set-off to that required in Australia and New Zealand waters, and in Canada, to provide adequate docking and repair facilities in those waters.

It is considered that the naval interests of the Empire are likely to demand within the next five years a Far Eastern seagoing fleet of considerable strength, and for the purpose of this chapter it is assumed that this fleet will be composed of:

8 battleships of modern "Dreadnaught" type.
8 battle cruisers, also of modern type.
10 light cruisers.
40 modern destroyers.
3 flotilla leaders.
2 depot ships for destroyers.
36 submarines (excluding those stationed in Indian waters).
4 submarine parent ships.
4 aircraft carriers.
12 fleet mine sweepers.
1 large seagoing mine layer.
2 fleet repair ships.

Division of Duties.

For these reasons the admiral of the fleet has for the first time authoritatively summed up what the several Dominions intimately concerned should do:

In considering means for the provision of the ships to form the Far Eastern Fleet and for the necessary convoy work it appears to be logical to put forward the following suggestions:

(*a*) That Canada's share should be that necessary to provide and maintain a small force of light cruisers on her western seaboard for the protection of her trade in those waters, as well as a naval force on her eastern seaboard.

(*b*) That South Africa's share should be that necessary to provide and maintain a squadron stationed at the Cape of Good Hope, and having the primary duty of keeping open the trade route round the Cape, and protecting the trade on the West Coast of Africa, leaving the trade to the eastward to the protection of the Far Eastern Fleet.

(*c*) That India might provide a certain fixed sum annually in relief of the estimates; such a sum, for instance, as would provide for the defense of her harbors, and would pay for the upkeep of the East Indies Squadron of five light cruisers, six submarines, and one aircraft carrier without, perhaps, paying the first cost of the ships, or for their replacement, for the reasons given. The sum required would be approximately £2,200,000 annually.

Since Australia and New Zealand would bear no part of the expenses of naval defenses in the Atlantic, it is suggested that their share in the Pacific should be more than is shown in the table (accompanying the next paragraph) for the whole Empire. The suggested proportion of the cost of provision and maintenance of the Far Eastern Fleet is, then, approximately:

Great Britain, 75 per cent	£14,066,800
Australia, 20 per cent	4,024,600
New Zealand, 5 per cent	991,600

Australia's Insurance Premium.

Having carried the argument for Imperial unity thus far, Viscount Jellicoe arrives at the general conclusion that for the future the whole Empire should share proportionally in necessary naval expenditure. Their respective shares worked out on the basis of population and sea-borne trade work out:

	Per cent.
United Kingdom	74.12
Australia	7.74
New Zealand	2.02
Canada	12.30
South Africa	3.82

according to which Australia is asked to find at least £3,973,800 in 1920–21 for naval defense, and gradually to increase her contribution as follows:

1920–21	£3,973,880	1924–25	£5,378,473
1921–22	3,960,600	1925–26	5,938,833
1922–23	5,348,653	1926–27	6,278,593
1923–24	5,486,013	1927–28	6,052,753

CANADA.

Source: Reliable.

PRINCE RUPERT SOUND.

Defenses.

None.

Anchorage.

Harbor about 5 miles long by 1 mile wide. Depths, from 18 to 24 fathoms. Bottom, mud.

Dry docks and repair facilities.—Grand Trunk Railway's dry dock and ship repairing plant.

Floating dock.

Lifting capacity, 20,000 tons.
Can raise a vessel 600 feet in length.
Dock has overall length of 604.33 feet on keel blocks.
Width (clear), 100 feet; overall, 130 feet.

This Grand Trunk Railway Co. has a shipbuilding shed arranged to build ships under cover.

Fuel supply.

Coal is shipped from Vancouver Island.

Climate.

Uncertain, no two seasons being the same, or appearing to follow any general law. During one summer fine weather may be experienced for six weeks at a time, and on such occasions a serene atmosphere will be experienced. The following summer may prove one of almost constant rain with a succession of gales from southeastward. Temperature during July and August, 1892, varied from 62° to 48° F.

The barometric variations are neither great nor frequent, the range for the year averaging about 1.5 inches.

Ice is formed during winter of from 8 to 12 inches in thickness and occasionally extends as far as 25 miles from the head of the inlet.

VANCOUVER.

Defenses.

After the declaration of war with Germany, the harbor of Vancouver, which previous to that time was entirely unprotected, was fortified against attack by warships by the placing of large guns at the entrance to the harbor, at a point designated as the Narrows, and a number of naval guns at strategic points along the approaches to the outer harbor. These defenses are probably not sufficient to protect the city against bombardment by warships, but would prevent access to the harbor and the destruction of shipping in the harbor.

Anchorage.

Mud bottom. Maximum depth about 36 fathoms. Vancouver Harbor is about 2¼ miles long and 1½ miles wide. Large vessels can anchor in English Bay and Burrard Inlet, bottom stiff mud.

Repair Facilities.

British Columbia Marine Railway Co.—
Marine railway, 625 feet long; cradle, 250 feet long, 45 feet wide, 12 to 18 feet of water at high water.
Capacity, 1,500 tons.
Small repairs to hulls and machinery.
Wallace Shipyards Co.—
Marine railway, 620 feet long; cradle, 240 feet long, 46 feet wide, 12 to 18 feet of water at high water.
Capacity, 1,700 tons.
Small repairs to hulls and machinery.
Proposed new graving dry dock (1914)—
Length, 1,150 feet.
Width of entrance, 110 feet.
Depth over sill at high water, 41 feet.
Floating dry dock (1916).

Arrangements completed for construction of a floating dock capable of taking an 18,000-ton vessel.

Climate.

Lowest temperature is about 23° F., the coldest months being December, January, and February. The greatest daily range occurs in March, and the smallest in October. Region possesses the climate of England without its humidity. Remarkably healthy.

HALIFAX.

Defenses.

Fort opposite Sandwich Point, 3 large guns, 10-inch (?).
Battery on Ives Point, 2 small guns toward city, 2 outboard—probably 10-inch (?).

During the war a net was stretched across the harbor at George Island.

Anchorage.

Harbor covers about 10 square miles. Affords space and protection for a large number of large vessels.

Docking and Repair Facilities.

	Length.		Width at entrance.	Depth on sill H. W.–O. S.	Remarks.
	Over all.	Over blocks.			
	Feet.	*Feet.*	*Feet.*	*Feet.*	
Halifax graving dock	600	570	85	30	
Patent slip No. 1 (3,000 tons)	.....	[1] 270	48	14 –18	
Patent slip No. 2 (900 tons)	.....	[1] 200	35	9 –14	
Patent slip No. 3 (150 tons)	.....	[1] 180	28	9 –14	
Patent slip No. 4 (150 tons)	.....	[1] 180	.....	9 –14	30-ton shears.
Marine railway:					
No. 1 (250 and 400 tons)	450	[1] 75 / [1] 120	.....	11 –14½	
No. 2 (300 and 600 tons)	450	[1] 85 / 110	.....	13½–16	
Liverpool, Nova Scotia, marine railway (400 tons).	450	[1] 120	.....	10 –12	

[1] Cradle.

Small repairs to hull and machinery at dockyard; large repairs to boilers at Hogan & Co., and large repairs to engines and boilers at W. A. Muir & Co.

Climate.

Subject to extremes of heat and cold, with rapid changes of temperature, the range of temperature being from 98° F. to 20° below zero, with changes of as much as 50° or more in a day.

The severity of the winter seldom sets in until the close of December; frost generally continues from Christmas until April.

Average annual rainfall, 31.91 inches; snowfall, 99 inches.

Open at all seasons. Navigation seldom interrupted by ice.

ST. JOHNS, NEWFOUNDLAND.

Repair facilities.

	Length.		Width.	Depth on sill.
	Over all.	Over blocks.		
	Feet.	*Feet.*	*Feet.*	*Feet.*
Reid Newfoundland Co.	610	569. 5	84. 75	23. 75
Sectional floating dock (200 tons)	135	135	49	11. 5
Harbor Grace, patent slip (150 tons)	260	[1] 90	.....	[2] 9 [3] 12

[1] Cradle. [2] Forward. [3] Aft.

Reid Newfoundland Co. repairs hulls and machinery at St. Johns.

Terra Nova Foundry & Boiler Works make large repairs to boilers and engines at Harbor Grace.

Anchorage.

Safe and commodious. Never closed by ice. Bottom is soft mud with gravel in places. Courtney Bay is to be utilized as part of St. John harbor.

Repair facilities.

Dry dock:
900 feet long.
100 feet wide at entrance.
37 feet over sill.

No extensive repair facilities for steel vessels. Those not over 225 feet in length on keel and not drawing more than 14 feet forward can be placed on blocks if necessary.

Climate.

About the same as Halifax.

MONTREAL.

Anchorage.

Berthing spaces in 1914 for ocean-going steamers:

20 berths for steamers 550 feet in length, drawing 30 feet.
36 berths for steamers 400 feet in length, drawing 30 feet.
17 berths for steamers 300 feet in length, drawing 20 feet.
19 berths for steamers 300 feet in length, drawing 10 feet.

Repair facilities.

	Length.		Breadth at entrance.	Depth.	Lifting power.
	On blocks.	Over all.			
	Feet.	*Feet.*	*Feet.*	*Feet.*	*Tons.*
Montreal Dry Dock Co	430	.....	45	11	.....
A. Cantin	400	400	45	10	.....
Duke of Connaught floating dock	.....	600	100	31	25,000

Large repairs can be done to hull and machinery.

QUEBEC.

Anchorage.

The harbor affords wharfage accommodations for 25 to 30 ocean-going vessels; water from 24 feet to 40 feet; in addition, wharfage accommodations can be given to a large number of ordinary size and small vessels.

The river at Quebec is about one-half mile wide, widening out about a mile below the city. The depth of water below the city averages about 24 fathoms, with mud bottom. Current is about 4 knots, flood and ebb.

Repair facilities.

	Length.		Width at entrance.	Depth on sill.
	Over all.	Over blocks.		
Davie's floating dock:	*Feet.*	*Feet.*	*Feet.*	*Feet.*
No. 1 (2,175 tons)	236	234	41	12
No. 2 (1,605 tons)	180	178	39	12
Davie's patent slip	500	[1] 120	.....	10
Lorne Dry Dock (Government)	648	600	62	25
Wolfe's Gridiron	322	.....	.....	.....
Russell's floating dock	288	.....	.....	14.5
Russell's Gridiron	200	.....	.....	[2] 17 [3] 14

[1] Cradle. [2] Forward. [3] Aft.

Large repairs to hulls and machinery by G. T. Davie & Son, and large repairs to machinery by Francis H. Drolat.

Climate.

There is sometimes ice in the river until May.

DATA FOR ESTIMATING COURSE OF A SHIP—CRITICISMS DESIRED.

Source: Reliable.

All naval officers are familiar with the importance of an accurate knowledge of the enemy course in battle. Past experience has shown that if the fire-control officer is familiar with the silhouettes of target ships, he can tell at a glance the course of the target ship within a few degrees.

The Office of Naval Intelligence is endeavoring to compile a file on each foreign navy which will contain data from which the course of any possible target ship may be estimated. In other words, the file must contain such data as will show our relative bearing from the target ship when the latter ship appears to us under certain conditions. A few of these conditions are outlined here:

No. 1 barbette just opening No. 2 barbette;
Side of No. 1 turret tangent to opposite side of No. 1 stack;
No. 1 stack just opening No. 2 stack.
Mast tangent to side of No. 1 barbette.

On certain ships there may be some prominent object, such as a crane, which could be used. No hard and fast rule can be laid down as to what objects to select. The Office of Naval Intelligence, therefore, depends upon the ingenuity of the individual officer, and requests all officers of the service to cooperate.

The following method for obtaining the desired data is suggested and comments are invited:

A foreign war vessel is anchored at F. Our own ship is at O. The officer desiring to obtain the data instructs an observer to run by the foreign vessel on any course BB′ (course need not be a steady one) and to make a signal when the foremast of the foreign ship is tangent to the port side of No. 1 turret; and to continue across the bow of the foreign ship and signal again when the boat is dead ahead.

On our own ship station two observers, one with a sextant and one at the range finder.

When the small boat makes signal that the given condition exists, in this case turret and foremast tangent, the angle F O B is measured (40°) and the distance of the boat measured (2,000 yards). Also measure the range to the foreign ship (2,600 yards).

When the boat signals that she is ahead of the foreign ship, measure the distance to the boat (2,500 yards), and the angle F O B′ (55°).

Plot these two angles on a plotting sheet or on cross section paper and lay off to scale.

O F = 2,600 yards;
O B = 2,000 yards;
O B′ = 2,500 yards.

Draw in F B and F B′. Measure the angle B F B′ (11°) which is the result desired.

Cases may arise where it will not be possible to take an observation from directly ahead; one from abeam or astern will do just as well.

Compass bearings may be used in place of sextant angles, and will be close enough.

When the data is submitted to the Director of Naval Intelligence care must be exercised to accurately describe the conditions which existed to give the results obtained.

GERMAN SUBMARINES.

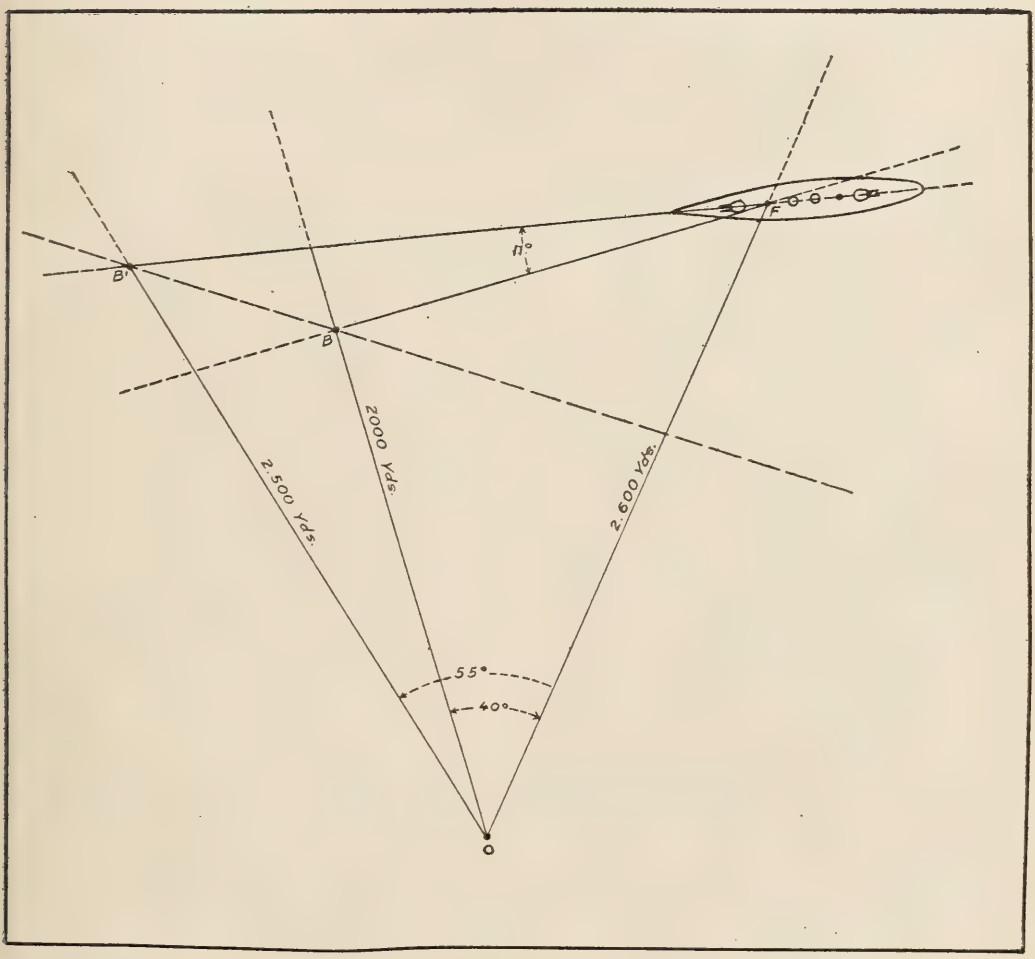
Source: Reliable.

(1) Submarines available at beginning of war	28
(2) Submarines available summer of 1917	212 (?)
(3) Total submarines built and laid down by Germany up to armistice: 169 U, 151 U B, 121 U C	441
(4) Submarines sold and turned over to friendly nations during war and included in (3): U B–8 to Bulgaria, U B–43 to Austria, U B–47 to Austria.	3
(5) Submarines actually built and laid down for Germany: (3)−(4)=(5)	438
(6) Submarines lost before armistice, including those interned in neutral ports: 67 U, 73 U B, 60 U C	200
(7) Submarines lost after armistice by sinking: U–97	1
(8) Submarines building and fitting out at armistice: 29 U, 15 U B, 26 U C	70
(9) Submarines available at armistice: (5)−((8)+(6))=(9)=168 (73 U, 60 U B, 35 U C)	168
(10) Submarines built during the war: (3)−((1)+(8))=(10)=343 (112 U, 136 U B (including 3 turned over to friendly nations), 95 U C)	343
(11) Submarines inspected in Germany: At Kiel, 11 U, 7 U B, 5 U C; at Brunsbuttel, 1 U, 1 U B, 1 U C; total, 12 U, 8 U B, 6 U C	26
(12) U–157, interned in Norway, November 11, 1918; U B–14, surrendered at Sebastopol, November 26, 1918; U B–42, surrendered at Sebastopol, November 26, 1918; U B–23, surrendered at Sebastopol, November 26, 1918; U B–37, surrendered at Sebastopol, November 26, 1918; U B–74, interned in Barcelona, November 21, 1918	6
(13) Surrendered at Harwich: 59 U, 51 U B, 25 U C	135

Summary of all submarines at end of war:

Losses before armistice (6)	200
Sunk after armistice (7)	1
Interned in neutral countries after armistice (12)	2
Surrendered in Harwich (13)	135
Surrendered in Sebastopol (12)	4
Inspected in Germany (11)	26
Building and fitting out (8)	70
Total	438
Turned over to Bulgaria and Austria (4)	3
	441

NOTE.—U–42 was not built.



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EXTRACTS FROM REPORT OF FORCE COMMANDER IN EUROPEAN WATERS.

Source: Reliable.

23 April 1920.

During my visit to Athens I met Admiral Chetwode of the British Naval Mission. Admiral Chetwode is, I believe, a captain of the British Navy. The head of the mission, Admiral Kelly, I was not fortunate enough to meet, as he had left Athens for a few days on some duty in connection with his work in Greece. I find that there is a large number of British naval officers on this naval mission, and I am told that the Greek Navy is practically in its hands. Counting all ranks, including warrant officers and specialists, there are about 45 British naval officers in Greece. As I understand the situation, their salaries and expenses are entirely met by the Greek Government. As these facts would indicate, British influence in Athens seems to be very great. I am told that at cinema shows when the British flag is displayed it is greeted with great applause, somewhat in contradistinction to the reception given the American flag when it is shown. I did not gather that this betokened hostility to the United States, but mention it simply as showing the popularity of Great Britain. A chance remark made by a Greek to one of the *Pittsburgh* officers on the train may be mentioned in the same connection; he said that Greece would be a British colony before long. This was probably an exaggeration, and the credibility of this speaker was something that could not be determined; but it is mentioned as having a bearing on the general sentiment of friendliness of Greeks toward the British nation.

NEW JAPANESE DESTROYER "SHIMAKAZE."

Source: Reliable.

6 April 1920.

(13024.)

The destroyer *Shimakaze,* building at the Maizuru Navy Yard, was launched on 31 March at 11 a. m.

The length of the destroyer is 320 feet, beam 29 feet, displacement 1,300 tons, and speed 34 knots.

She has three 4.7-inch guns, 6 torpedo tubes (3 double barreled), and two searchlights.

Her complement is 148.

Turbine driven, twin screws, and oil burning.

ORDNANCE.

MISCELLANEOUS ORDNANCE NOTES.

Source: Reliable.

16 April 1920

(12604)

Difficulties of Gun Ports of 6-inch Battery Guns on British Ships not being Water-tight.

On page 14 of the Bulletin of Ordnance Information of February, 1920, it is stated that the question of installation of shields on broadside mounts of battleships has arisen in connection with the reinstallation of broadside batteries on battleships from the *Delaware* to *Texas* class. The Bureau of Ordnance in conjunction with the Bureau of Construction and Repair has authorized the Naval Gun Factory to build a model of a gun port in connection with shields for the mounts which it is hoped will be a satisfactory solution of the question of providing water-tightness.

The most interesting solution of this question which has come to our notice is the construction on the German battleship *Baden*. On this ship everything was water-tight, although at the same time the freedom of motion of the gun in two directions—i. e., in train and in elevation—was in no way obstructed. This was accomplished by having a vertical shield which was of cylindrical shape. The plate ran over from each side till it formed a sort of rolling or sliding contact along this cylindrical face. It then extended a short distance back and very closely fitted around the cylinder. The curvature of the cylindrical shield was thereby utilized to make a crooked or curved opening so that, even if the packing arrangements failed, the water could not dash in with quite so much freedom as would have been the case if the part fitting around the arc of the cylinder had not been provided.

When it came to elevation a similar scheme was used. In this case a cylindrical surface made out of plating was provided, the axis of this cylinder being the axis of rotation of the trunnions. The part which ran over close to this cylindrical surface to keep the water out was of the same construction as the other one previously described. In other words, it did not simply run over as a straight plate to the cylindrical surface, but after touching it it continued around the cylinder at a very short distance from it,

so that there was no straightaway opening, but such a one that if the water had to come in it must penetrate for a considerable distance around between the cylindrical surface and the other one which, at a very short distance, exactly followed this curvature. This is the same way that the port shutters in the German turrets work. They are of cylindrical form and have something to slide against in quite close contact, so that water is well excluded. In fact, the water-tight arrangements for broadside guns are practically replicas of similar shields used in turret-port construction in the German turrets. The essence of the German idea is to have a cylindrical surface which for a short distance closely follows the curvature of the cylindrical shield.

Having in mind our own design, the D. N. O. was asked whether the construction seen on the *Baden* had appealed to them. He said that they had just had strong complaints from their First Battle Squadron concerning the drowning of the 6-inch battery guns through the ports when rolling heavily in the Atlantic between Gibraltar and the channel, and that they are considering how they could best adopt the *Baden* system to remedy the trouble. He says that the water is principally deleterious to the electrical instruments on the mounting and the night sights and the firing circuits.

It thus appears that the necessity for making the gun ports more water-tight has at this time come not only to the attention of our own Navy, but to the attention of the British Navy. With proper mechanical arrangements it should be possible to fire a broadside battery in almost any sort of sea. The German system described seems at the present time to be the one which most strongly appeals to the Admiralty. The exact construction of the packing—whether to use rubber rollers or some other peculiar construction—are details which different services should work out separately. But this being a mechanical problem with which we are faced, it is very difficult to suggest anything more reasonable than, or superior to, the *Baden* system, and the Admiralty knows of no better scheme.

Propellents.

The Admiralty has not yet troubled about flashless powder except for the Air Force. They are working rather to improve the stability and regularity of the cordite; also to get, if possible, a propellent which can be made in England without being so dependent upon overseas raw materials (cotton, glycerin acetone, and mineral jelly). But the first considerations are accuracy and stability.

Long-Range Gun of Delamare-Maze.

Recently in the press there have been references to the invention of M. Delamare-Maze. In L'Intransigeant of 16 March, 1920, there appears the following:

"*1,300 meters per second!* Such to be the velocity of the projectile of the new gun, of which the range will be tremendous.

"We have already announced that the Government had bought the patent of a new gun, of which the range is three times that of the 'Berthas.'

"In 1918, as soon as this famous German gun commenced firing, our engineers started work.

"In 1918, an engineer army lieutenant, M. Delamare-Maze, found means of firing a distance four or five times as great as that accomplished by the projectile of the 'Big Bertha.'

"M. Delamare-Maze spent long months perfecting his invention, and toward the end of 1919 he submitted his plans for the new gun to the French Government.

"The French Government had a battery constructed for tests. These tests were so satisfactory that the Government immediately purchased the patent from the inventor.

"It seems that the velocity of the projectile thrown by this new gun is increased by 50 per cent. As to the range, it is tremendous.

"For example, the velocity of the French shell, which was 800 meters per second, reaches 1,300 meters per second.

"Further, this invention may be applied to guns actually in use at very little expense. Certain changes must be made to the guns and to the projectile, but the expense is very slight.

"The invention of M. Delamare-Maze seems to be very simple. It is, they say, like the egg of Columbus, but it had to be thought out.

"The new invention can be applied to all calibers from the 'canon-revolver' to the larger guns.

"M. Delamere-Maze states that his invention can also be adapted to rifles and probably to machine guns, which is very important for indirect fire. No experiments have as yet been made along this line.

"It is said that the inventor has been authorized to sell his invention to the allied Governments.

"Tests are to be made in the immediate future in Belgium, and propositions have been discussed in England. As soon as our artillery has been equipped with this new invention the enemy's guns will not be able to counter-fire a barrage fire carried out by our batteries with the new invention."

Recently the Naval and Military Record also commented upon it, and in a very hazy description referred to two cylinders on the sides in which the charge or parts of it were contained in firing. They went on to speculate as to whether it was like the German long-range

gun or not, and decided it must be different, and, on the basis of what it would be like, if it really worked, they indulged in quite a discussion. Questions about it were asked in the House of Commons. The Government replied that, because of their good relations with the French, they were keeping thoroughly in touch with the interesting proposal of this inventor and that the members could rest assured that if it worked out British ordnance would not overlook its advantages. There was naturally no indication given as to how they thought it was actually coming along. It has been difficult to find out much about it, but the following is a direct quotation from a short memorandum by the D. N. O.:

"Have you run across one Delamare-Maze, the French inventor, whose wonderful(?) gun has so lately been boomed in our press? An eminent British engineering authority, to whom we referred Maze's ideas for opinion, said that as far as he could see the first result would be to kill the gun's crew, and he was quite correct, judging only from the sketch forwarded him."

BARR & STROUD RANGE FINDERS.

Source: Reliable.

23 April 1920.

(13092)

A later report states that the Barr & Stroud vacuum range finder has not as yet been perfected. This report is published however as being of interest. The latest report will be published in the next issue of the Monthly Information Bulletin.

The range finder used in H. M. S. *Hood* is the 30-foot F. X. type. It is stated that the Admiralty was so well impressed with this range finder that they intended to install them on a large number of the older ships. The question was raised as to whether this range finder involved the principle of exhausting the atmosphere within it. In a comparative test of the Barr & Stroud and Bausch & Lomb range finders held at Whale Island some years ago, it was reported that one of the engineers of the Barr & Stroud Co. said they had great hopes for this idea. They had held a large number of temperature tests to ascertain why range finders varied with temperature. They had learned that the prisms were distorted by temperature and that the metal in the different parts of the framework expanded. They were able to account for a good part of the observed error, but a certain amount of unexplained error continued to remain. This had puzzled them greatly until some one suggested that as the temperature varied convection currents within the tube of the range finder did not succeed in maintaining the contained air at a uniform temperature throughout. The warmer air would rise to the top of the tube and

the air inside of the tube introduced an optical effect due to the fact that different parts of it had different indicies of refraction.

The obvious answer was to get rid of the air which was causing the trouble. They did not find it answered to take out all of the air. Taking out a considerable amount of it would eliminate practically all of the effect. The remaining error was not difficult to compensate or allow for because it followed regular rules, and the variation was very nearly the same under similar conditions. In other words, Barr & Stroud maintained that the erratic behavior of range finders was due to two causes: (*a*) The temperature effect in the metal and glass and (*b*) the temperature effect of the air within the tube. The first part of this was not difficult to handle in design. It was the second part, i. e., the behavior of the nonuniformly heated air within the tube, which largely explained the erratic behavior of range finders. When they eliminated the air by pumping out to a partial vacuum they expected to have a range finder which would be a great improvement. This was about two years ago and no direct information in the meantime has been obtained.

It is interesting to learn that Barr & Stroud state definitely that vacuum range finders have been actually adopted in the British Navy; that the range finders of the *Hood* are of this type and that others similar to them are contemplated to replace those in certain older ships. There is a small automatic electric pump and a desiccating apparatus.

It was stated that the Japanese Government were Barr & Stroud's principal foreign customer and that Japanese inspectors were very numerous throughout their works. It was also stated that Barr & Stroud had supplied 15-foot range finders for the Argentine battleships built in the United States but that these were of an earlier type and were not satisfactory. They have built no naval range finders over 10-meter base. They are not exporting at present anything over 30-foot base. It was not practicable to obtain any definite information as to the Japanese contract except that it was a large and very carefully inspected one, but it would seem that the Japanese were buying F. X. range finders either of 30-foot base, similar to those in the *Hood*, or the same thing with a 10-meter base and, if the latter were the case, none of the 10-meter base range finders had yet been exported to Japan.

The question was asked whether the Japanese had done much range-finder development work themselves or whether they were depending entirely upon the Barr & Stroud Co. It was stated that the Japanese had previously bought range finders from wherever they could get them and had attempted to duplicate them and improve on them. This looked like a reasonable policy but they had been so

unsuccessful in carrying it out that they had definitely decided not to try to manufacture range finders in Japan but to get them all from the Barr & Stroud Co. Everything considered, this seems probable. It is certain that the Japanese are buying range finders in quantity and not simply a few for samples.

It was stated that during the war the Japanese had purchased some range finders in the United States from Bausch & Lomb because, for their three big ships under construction, the Admiralty had not been willing to give them sufficient priority with Barr & Stroud. It is thought that these were 15 or 20 feet base. At any rate, it was said, that the Japanese had been very displeased with the performance of the Bausch & Lomb range finders and had decided that they were not satisfactory and were now replacing them with Barr & Stroud range finders. If this is the case, it may be that one reason for the change was because the Japanese felt the need for range finders of longer base.

The statement that the Japanese range finders were similar to those of the *Hood* was understood to imply that they included the vacuum feature.

The question was asked whether they (Barr & Stroud) had done anything in the way of stabilized sights or periscopes. The answer was that they had done much special fire-control work before the war but that during the war conditions were such that they were forced into more nearly the purely optical end of the business. Their last attempt was a "R.O.C.O.R.D." instrument (abbreviations for "Rate of change of range and deflection"). This was a sort of range clock with a range finder attachment. The Admiralty had not thought much of it but they had sold one to the Dutch Navy. Prof. Barr had worked for about a year and a half on an anti-aircraft fire-control scheme which was finished after the armistice and, although part of the contract was canceled, the war office took quite a number. But they did not have much fire-control paraphernalia outside of their transmission instruments. The limitations of the Barr & Stroud transmission which is not self-synchronizing were admitted, but it is said that their automatic transmission was very good. This automatic transmission is similar to the ordinary Barr & Stroud transmission except that one does not actually rotate a crank. Instead, the operation of a small controller in a motor does the turning and when the right number appears the controller is used to shut off the motor.

The question was asked whether they had made any torpedo directing gear. The answer was that the large ring which they placed on the submarine periscopes was their only attempt and that attachments similar to this were simply small features which had been installed on the optical instruments by Admiralty instructions.

Barr and Stroud are apparently well pleased with the depth and roll recorder for torpedoes which they had undertaken as a sort of side issue.

ADDRESS BY GENERAL CHARBONIER, HEAD OF THE FRENCH ORDNANCE MISSION IN THE UNITED STATES.

I must ask you, to begin with, to excuse my extremely bad pronunciation. I do not speak English. Nevertheless, I am going to try to say a few words in your language, thanks to the assistance of an American officer who has translated my French speech for me.

I do not know how to begin to thank you enough for the cordial reception you have all accorded me to your shores. Your Secretary of War as well as your Secretary of the Navy greeted us with warm hospitality and kindly put us in touch with their experts.

These specialists in ordnance and artillery took us to their hearts.

Now the Secretary of the Navy makes us feel by the gracious speech of welcome which he has just made, that although we have left France we are nevertheless near our own friends.

It is my wish to define in a few words the really vital reason for the existence of our mission and its trip to America. We are, as you know, ordnance experts, who worked for a common cause during the great war. We experienced the most cordial and agreeable relationship during this time in common labors which brought us into contact with specialists in the same branch of the allied armies. Each one of us who has now returned home, has as his sacred duty the obligation of assuring the permanency of these connections formed under stress of a mutual danger.

The important question now before us is "What shape will the technical entente take in the future?" Will it have some permanent central bureau or periodical conferences of specialists; will this entente be continued purely on a personal basis; or will technical information be exchanged through diplomatic channels? This depends on the future political decisions of our nations and these we are in no wise qualified to prophesy. Ordnance is our province and we must limit ourselves thereto. We must, to this end, be always prepared to lend our complete support to any plans to complete a close liaison between those nations who together fought for the cause of liberty and justice to the end that a permanent peace may be assured for all time as a result of our labors.

Peace is such a precious commodity that we should be willing to pay a high premium to assure ourselves of its continuance, and we of the ordnance make up a no mean part of such an insurance. Napoleon said "Artillery has been and always will be the determining factor of armies and peoples." The war through which we

have just passed proves that this dictum holds good under even the most modern conditions.

Ordnance has a bearing on the temper of a people in peace as well as in war. It is not only when guns go into action at the front that they have their effect. The principal fact of their existence is in itself a determining factor. Arsenals always prepared to run to the full capacity, matériel at all times developing alongside the latest progress of science and industry, factories ready to furnish products by the wholesale at a word of command, all these constitute the most effective safeguards for nations like our own, against treacherous peoples still tempted by diabolical plans for world destruction and domination.

It is for these reasons that questions of ordnance are now occupying the center of attention of the various nations, not only with the intention of producing weapons already in surplus, but with the object of finding what in the future is the best way to organize the ordnance service, so as to allow it always to be in a position in the army to discharge its important duties in the most effective manner.

I take the liberty of calling this question to your attention, gentlemen, as it is in France to-day a most vital one. I do so also because I contend that the object of this particular mission, to-day, is not only to inspect guns, arsenals, and proving grounds, but to exchange ideas and to say "Here's something we think is good in our country; what do you think of it?"

It is in this way that we may transform the good of the world for better.

I have said that the organization of the ordnance has interested us greatly in France. We do not wish at this juncture to hide from others the conclusions reached as a result of our years of world war. Two things have been agreed on in this particular.

First. It is impossible for one man to be trained in and to embrace everything necessary to make war. That is to say, we must allow the two sciences, military and technical, to specialize. We were forced to create, during the war, a ministry of armament with this in view and it was the duty of the ministry to conceive, plan, experiment with and manufacture all ordnance matériel.

It is probable that this organization will replace our former one under our new army organization. Technical artillerymen are a separately organized corps and distinct from combatant artillerymen. They are recruited and formed in our École Polytechnique, the training school of our Government engineers, and study engineering there in all its branches, and afterwards specializing in the study of theory and construction of arms and ammunition. By a technical separation, do not think I mean a reciprocal ignorance and water-tight compartment system. Cooperation is absolutely essential.

These ordnance officers make certain a permanent liaison between artillery and its kindred collaborators, science and industry.

On these two, artillery depends for its development. This system of separating the two elements, technical and combatant, has also been tried out in the naval artillery organization, and I feel that its record has fully justified its existence.

The second principle which the war brought to light was the complete destruction of all distinction (previously scholastically established and especially hallowed) between different types and kinds of artillery. The field, mountain, colonial, coast, and navy artillery and guns of any kind, caliber, power, and nomenclature, found themselves automatically turned toward the East, to be trained on a common enemy, and if the enemy had come by sea, all these guns would have concentrated their fire to defend our coast.

Unity of effort during war, unity of tactical operation on one hand, and on the other the absolute identity of scientific and technical principles, of conception and construction, point to the conclusion that in the domain of ordnance any such distinctions are purely a fallacy. The province of ordnance begins with the revolver and ends with the largest caliber gun. The science and technique of artillery are one and the same and we see that the large private firms, Bethlehem, Armstrong Creusôt, Krupp, have for all artillery, field, coast, siege, and navy, but one technical organization.

We French will naturally tend to go to the extreme in this direction. Many among the most farsighted of our men see the best solution by a single ordnance corps to supply all arms and munitions for all combatants.

I do not know whether these same questions, gentlemen, are being discussed in your country. Having been equally well received by the War Department, and by the Navy, by the Coast Artillery, by Field, and by the Ordnance, I can only draw the conclusion that the cooperation and efficiency is as effectively developed in your other branches of the service as with those who were concerned in our reception.

The exchange of general ideas is a means of liaison between technical men which needs an occasion such as this to offer an opportunity. We should try to create other vehicles for the exchange of ideas and I must take the liberty of suggesting one.

It is not for me to try to demonstrate to America the power of the press, either in political or technical spheres. Why may we not turn it to our own use? You may remember a paper which appeared before the war, "Memorial de l'Artillerie Navale," which published a number of papers, since famous, and which are in reality the basis of all modern artillery. This paper ceased to appear in 1914, but will reappear in 1921, in new form. As an agitator for the union of techni-

cal corps such as I have mentioned, I have the consent of our ministry of war and navy to have it published for both branches and called "Memorial de l'Artillerie Francaise," and to have it devoted to artillery. Both private French interests as well as the University will be represented on the board of direction, of which I have been named president.

Now, it is my desire to make this the great scientific artillery journal for all nations who have fought by our side. I should like to have it a permanent liaison factor between technical men who speak the same language and face the same problems.

And now, gentlemen, may I, in closing, make an appeal to all those in your country who love the science of artillery, theorists, technical, and practical men, artillery men by profession, men interested in ordnance, or university men, and may I assure them that I will work in technical interests and in practice, on those subjects which in this great country you have a manner of treating in that large way which we so much admire?

I fear, gentlemen, that I have trespassed on your patience and forbearance by changing some few words of thanks into a technical paper. If I have done so, I can only offer, as an excuse, the explanation that the warmth of your welcome has placed me so completely at ease that I have spoken frankly and with enthusiasm about the topic which is nearest my heart.

May I take this opportunity in closing to thank you for your cordial reception, which has touched me so profoundly, and to extend at this time my wishes for the continued understanding which draws our two countries closer together, and my admiration for the splendid work in the past of the American Army and Navy.

ENGINEERING.

DIESEL ENGINES, MANUFACTURE AND DEVELOPMENT IN SCANDINAVIA.

Source: Reliable.

15 April 1920.

(13044.)

Marine Diesel engines are at present manufactured in Scandinavia by the following firms:

Messrs. Burmeister & Wain, Engineers and Shipbuilders, of Copenhagen, Denmark.

Akers Mekaniske Verksted (Ltd.), of Christiania, Norway.

Gotaverken (Ltd.), of Gothenburg, Sweden.

Atlas Works (Ltd.), of Stockholm, Sweden.

Messrs. Burmeister & Wain of Copenhagen have manufactured marine Diesel engines on the four-cycle principle since 1912 and all the ships built and engined with Diesel motors by this firm are successfully running to-day. This firm holds the patent rights for the manufacture of engines on the Diesel principle and have licensed Akers Mek. Verksted (Ltd.), of Norway, and Gotaverken (Ltd.), of Sweden, to build the Burmeister & Wain type of marine Diesel engine.

The Atlas Works (Ltd.), of Stockholm, manufactures only engines on two-cycle principle and, so far, only small sizes.

Messrs. Burmeister & Wain have since 1912 been almost exclusively occupied in building Diesel motor vessels, except during the war, when their works, as far as shipbuilding was concerned, was practically stopped for a period of three to four years because of want of material.

The following is a list of Diesel motor vessels built by them since 1912:

For the Eastasiatic Co. (Ltd.), of Copenhagen.

2 vessels, each 7,400 ts. d. w., 2,500 I. H. P., 11 knots.
10 vessels, each 9,500 ts. d. w., 3,100 I. H. P., 11½ knots.
1 vessel, 6,800 ts. d. w., 4,000 I. H. P., 13 knots.
1 vessel, 10,800 ts. d. w., 3,100 I. H. P., 11½ knots.
1 vessel, 13,100 ts. d. w., 4,500 I. H. P., 12 knots.

United Shipping Co. (Ltd.), of Copenhagen.

2 vessels, each 8,500 ts. d. w., 2,700 I. H. P., 11 knots.

Fred Olsen Line of Christiania.

2 vessels, each 10,800 ts. d. w., 3,100 I. H. P., 11½ knots.

Johnson Line (Ltd.), of Stockholm.

6 vessels, each 6,500 ts. d. w., 2,000 I. H. P., 11½ knots.
2 vessels, each 6,500 ts. d. w., 2,600 I. H. P., 11½ knots.

This makes a total of 27 vessels. Besides this 18 Diesel motor vessels have been built within the same period by other firms holding license from Messrs. Burmeister & Wain, so that the total number of Diesel vessels with their engines to-day is 45 vessels with a total d. w. carrying capacity of 361,000 ts. and a total I. H. P. of 124,200, which shows that the Burmeister & Wain Diesel engine by now is far beyond the experimental stage and no doubt in the future will be extensively used as a means of propulsion.

It is interesting to note the way in which the above-named leading firms in Scandinavia have been convinced that the Diesel motor is far superior to any other means of propulsion. The start was made 1912 by the Eastasiatic Co. (Ltd.), of Copenhagen, who ordered three vessels with Diesel motors from Messrs. Burmeister & Wain. After delivery of same and after their success was assured they ordered the large number of vessels mentioned above from Messrs. Burmeister & Wain and by now they have entirely done away with steam vessels in their fleet, which is now solely propelled by Diesel motors.

The Johnson Line (Ltd.), of Stockholm, was the second firm to go in for ships with Diesel engines and from the start their confidence in the Diesel engines was such that this line ordered six vessels and when these were delivered the order was followed by another also for six vessels from Messrs. Burmeister & Wain.

The United Shipping Co. (Ltd.), the oldest steamship company in Copenhagen, gave Messrs. Burmeister & Wain an order for one Diesel motor vessel and placed at the same time with another yard an order for a sister ship with triple expansion engine in order to be able to compare the merits of the two systems, the result being that the company after having run the two vessels for about a year placed an order for four additional vessels with Messrs. Burmeister & Wain; three of these were later on canceled because the material was not forthcoming, but the company has now ordered hulls to be built at other yards, partly in Denmark and partly in Great Britain, for the Diesel engines, which are at present being built at Copenhagen.

The next firm that went in for Diesel motors was the Fred Olsen Line (Ltd.), of Christiania, who ordered three vessels from Messrs. Burmeister & Wain for hulls built at another shipyard.

Other well-known Scandinavian shipping firms have ordered Diesel motor vessels from the firm licensed by Messrs. Burmeister & Wain; For instance, the Trans-Atlantic Line (Ltd.), of Gothenburg, which up to the present has had two Diesel motor vessels of about 9,000 ts. d. w., each built by Gotaverken (Ltd.), of Gothenburg. This

firm has also tried to run Diesel engined vessels and ordinary triple-expansion engined vessels in the same trade, with the result according to their own statements that the cost of transporting of 1 ton of cargo 1,000 sea miles costs by means of a Diesel motor vessel about 24.60 kr., against 42.40 kr. in case of a coal-fired steam vessel.

As far as I can ascertain Messrs. Burmeister & Wain have at present orders for 34 Diesel vessels varying from 6,500 up to 13,600 ts. d. w. and from 2,600 I. H. P. to 6,000 I. H. P. per vessel. These vessels have been ordered by the following firms:

The Eastasiatic Co. (Ltd.), of Copenhagen.
Fred Olsen Line (Ltd.), of Christiania.
Thoresen Line (Ltd.), of Bergen.
Nordenfjeldske Line (Ltd.), of Tonsberg.
Johnsen Line (Ltd.), of Stockholm.
Swedish Eastasiatic Co. (Ltd.), of Gothenburg.
Wilh. Wilhelmsen, of Tonsberg.

Besides these ordered, Messrs. Burmeister & Wain have orders for marine Diesel engines for 17 vessels built at other yards in Denmark, Sweden, and Great Britain. The firms that have ordered these engines are:

The United Shipping Co. (Ltd.), of Copenhagen.
The Eastasiatic Co. (Ltd.), of Copenhagen.
Moller Line, of Copenhagen.
The Steamship Co. "Gylfe" (Ltd.), of Copenhagen.
The Steamship Co. "Atlanterhavet" (Ltd.), of Copenhagen.
Ocean Steamship Co. (Ltd.), of Liverpool.

The Eastasiatic Co. (Ltd.), of Copenhagen has had several instances where ships have left Copenhagen going to the Pacific coast around the Horn or through the Panama Canal, thence to Japan, and returning to Copenhagen by way of the Suez Canal, a voyage around the world that takes seven to eight months. The stay at Copenhagen between such voyages has only been very short for discharging and taking in cargo, and hardly any repairs have been made on the engines. In fact, the owners of the motor vessels hold that the cost of upkeep is less than in the case of steamers.

It is heard indirectly that the total costs of engine repairs to the whole of the motor ships owned by this company since adopting the Diesel engine amounts to about 3,500,000 (Danish) kroner only. This over a period of about eight years with a fleet averaging up to 15 vessels.

Messrs. Burmeister & Wain Engine Works at Copenhagen are able to manufacture twin Diesel installation up to 8,000 I. H. P. or more and are at present actually manufacturing 6,000 I. H. P. twin sets. The capacity of their works is such that they are able to turn out about eight twin Diesel installations a year in addition to those re-

quired for their shipyard, and recently a new site has been acquired in the harbor of Copenhagen for the purpose of extending their foundry to enable them to increase their output of marine Diesel engines.

Up to the present mostly twin-screw Diesel engine vessels have been built, but Messrs. Burmeister & Wain now manufacture single-screw Diesel engines as well, the reliability of the marine Diesel engine now being such that a single-screw installation is considered just as reliable as twin screws.

The weight of a complete Diesel installation in a ship does not exceed that of an ordinary steam installation to any marked extent, but the space occupied by the former is considerably less. The weight per I. H. P. including all auxiliary machinery in the engine room, shafting, and propellers is about 0.22 per I. H. P.

Messrs. Burmeister & Wain guarantee that the consumption of oil per I. H. P., using oil of 10,000 calories, does not exceed 160 grammes per hour, including the oil used by all the auxiliary machinery.

The following firms outside Scandinavia hold license to manufacture Burmeister & Wain marine Diesel engine:

For Great Britain, Messrs. Harland & Wolff (Ltd.), of Glasgow and Belfast.

For Belgium, Societe Anonyme John Crookerell Seraign.

For United States, Messrs. Cramp & Co., Shipbuilders, of Philadelphia.

For France, Societe Anonyme Delauney, Velleville.

Regarding the output of the two works Akers Mek Verksted (Ltd.), of Christiania, and Goteverken (Ltd.), of Gothenburg, I am so far unable exactly to ascertain this, but it appears that both firms have built a number of Diesel motor vessels and have a large number of orders in hand.

The present price of Burmeister & Wain's Diesel engine is about 600 (Danish) kroner per I. H. P., with the weight of the present modern design working out at about 0.22 tons per I. H. P.

GERMAN SUBMARINE ENGINES.

Source: Reliable.

8 April 1920.

(12775)

The following article has been translated from Schiffbau, 11 February 1920, and contains some interesting comments from the German point of view relative to an article which appeared in a January number of "Engineering." It is believed that these comments will be of interest:

"The author appreciates the competency of the critic and the insight which has enabled him to assign reasons for the development of the engine in its present form. But he refutes at considerable length the charge that the Germans deliberately led English, French, and American engineers astray as to the value of the two-stroke engine of the type originated by the Maschinenfabrik Augsburg-Nurnberg A. G., while secretly reserving to their own use the four-stroke engine which has since proved so greatly superior. It is admitted that the Nurnberg two-stroke engine was put on the market before its development was complete, but it appears that it was only subsequent experience that proved it the less suitable for submarine work, and that, not because its fuel consumption, but because of its greater weight. The article in "Engineering" alleged that Germany before the war employed the two-stroke engine for submarines, but during the war used the four-stroke engine exclusively. The author affirms that the four-stroke engine was even at that time considered the more suitable in Germany; but because of the favor shown by foreigners for the two-stroke engine, the German works, in order to meet the demand, were organized to build this type; the Germans were therefore constrained to use it in a great number of boats even after the commencement of the war.

"The two-stroke engine, however, possesses some advantages over the four-stroke, and may even yet, after much experimenting, be brought at least into serious rivalry with it. The working cylinders are small and light, yet at present the weight so gained is lost in the heavy scavenging pumps, so that a heavier and longer engine is the result. The piston speed and mean pressure must be kept lower because of the difficulties of cooling. On the other hand the two-stroke engine can be very easily and simply reversed; and there is but little difference in the oil consumption. At present, therefore, there is little except the excessive weight in which the engine is worse; and attention to the scavenging problem should in time remedy this defect. It is noted that experience with manganese bronze cylinder covers was not fortunate, and they were abandoned. It appears that the Germans were able to develop 3,500 b. h. p. on two shafts in the largest boats (the author states that recently a four-stroke engine has been constructed to develop 3,000 b. h. p. in one unit of 10 cylinders), while 2,400 was the largest b. h. p. developed on two shafts in an English boat; the S (?) class submarines, which were fitted with engines of 3,600 b. h. p., having three shafts.

"With regard to the power of endurance of the larger German motors, which was challenged in 'Engineering,' it is claimed that these engines were all tested for long periods in the shops, for example, for seven days at full power, before they were installed in the ship. The piston speed of 6.71 m/s gave good results in practice, but all

the moving parts were necessarily cut down to the minimum weight. The superiority of the German engine in a number of particulars is appreciated; for instance, the English were unable to rival the thin steel casting for bedplates, etc., and had to resort to gun metal and manganese bronze to keep the weight low. The necessity for electric gearing for reversing is also avoided in the German boats, where a most efficient direct reverse without complications or loss of weight was obtained.

"The criticism that the relative inaccessibility of the fittings and pipe connections showed want of thought in design is countered by the statement that the whole aim of the German designers was to make a compact engine and save space."

ADDITIONAL DATA ON SUBMARINE NO. 24 AND TWO SISTER SUBMARINES.

Source: Reliable.

6 April 1920.

(6452)

Number 24 (second-class submarine), constructed at the Mitsubishi Shipyard, Kobe, was launched on the 9th of March at 9.50 a. m.

Construction began on 18 August, 1919.

After she is inspected in October she will be handed over to the naval authorities for use at the Yokosuka naval station.

This submarine is about 220 feet long. Has a long large blister on each side. Is of the Vickers (British) type.

Has four 21-inch torpedo tubes in the bow; two on each side of the stem.

Speed, 18 knots on the surface; 10 knots submerged. Surface displacement, 1,100 tons.

Two sister submarines are building at Mitsubishi Works, Kobe, one to be ready for launching about 1 May, the other about 1 July. They are the same size and type as the one launched 9 March, and the one already in the water at this yard.

This makes four submarines of this class now at this yard.

The engines for all four boats (full Diesel) are completed in the shops, as are also the conning towers.

DIESEL ENGINES—OPERATIONS OF—ON TWIN-SCREW MOTOR SHIP "AFRIKA."

Source: Reliable.

(13044.)

The large motor ship *Afrika*, owned by the East Asiatic Co., and recently completed by Messrs. Burmeister & Wain, had a most successful official trial to-day on the measured mile off Copenhagen.

The first thing that impresses one on seeing the engine room of a motor ship of this type is the cleanliness of everything and the large number of moving parts visible in spite of the fact that the two main engines are completely inclosed. At the same time there is ample space everywhere, with the auxiliaries arranged in easily accessible positions. Electricity plays a very large part in the general scheme of things, and the switchboard in the engine room is a fitting of some magnitude.

The main propelling machinery consists of two sets of six-cylinder Diesel engines of the standard Burmeister & Wain four-cycle pattern of strong design, fitted with the usual type of valves operated by cams, diameter of cylinders 747 millimeters by 1,200-millimeter stroke, each set designed to develop 2,500 I. H. P. with 150 revolutions

Maneuvering the main engines is simplicity itself, necessitating the pulling over of a small lever arranged at the center of each engine and manipulated from the main platform.

Reversing is accomplished by withdrawing the cam levers from the engine toward the center of the ship, and moving the complete cam shaft forward, thereby placing a new set of cams in the working position; the cam levers are then thrust back into place and the valves are once more in action. All three operations are accomplished in a very short time; about 15 to 20 seconds was the time taken to-day to completely bring the engine over from full ahead to full astern. The services of a small air compressor housed with the engine is utilized for this purpose.

Four Diesel sets complete with dynamos for driving the auxiliaries are arranged on the port side of the engine room. Two of these are required to drive the auxiliary machinery—one is installed as spare, and the remaining set is required for No. 3 hold, which is insulated. The auxiliary machinery is arranged at the forward end and starboard side of the engine room and is driven throughout by electricity.

The oil fuel is pumped from the double bottom tanks into two daily supply tanks, one for each engine situated in the engine room. The tank situated between the two shaft tunnels is arranged for heating by means of steam coil. The steam is taken from a small auxiliary boiler in the engine room. The purpose of this boiler is to supply the steam necessary for heating the living rooms in the ship,

and it also supplies steam for a small air compressor giving the necessary compressed air for the first start of the engines; later on this is not necessary, as the compressors which are directly connected on the main engines supply the compressed air required.

As regards the present trial, the machinery worked without a hitch of any sort, and I was immensely impressed with the performance of the main engines. I was allowed access to the whole of the data acquired during the day and examined certain of the indicator cards taken. A total speed of 13.3 knots was attained, with a mean I. H. P. of 4,778 and revolutions 122.8. The consumption of fuel was carefully checked and was found to work out at 138 grams per I. H. P., approximately 16.3 tons per 24 hours total, for the whole of the machinery.

The ship, of course, was running fairly light with a small amount of cargo only, but it is estimated that the horsepower developed should suffice to propel the vessel at about 12 knots, fully loaded. This result, I think, is extraordinarily good for a ship of this size, i. e., 13,100 tons d. w. The oil used was supplied from the storage tanks of the East Asiatic Co., and is similar in every way to the oil used for the remainder of their vessels on service.

A very high opinion was formed of the engineering staff employed. Every man seemed to know his particular job thoroughly, and, moreover, appeared enthusiastic about the performance of the machinery, the manipulation of which was done by the ship's engineers without any expert assistance from the contractors. The personnel of the engine-room department in this particular ship consists of 1 chief engineer, 3 experienced engineers, 6 assistant engineers, 1 electrician, and 4 oilers—a total of 15 hands.

Constituting a watch, 1 experienced engineer, 1 assistant engineer, and 1 oiler, with the electrican available when required. Incidentally all the engineers are thoroughly experienced in the manipulation of the switchboard, with a sound knowledge of electricity, which, of course, is very necessary in a ship of this description.

The chief engineer informed me that the outfit requires careful and constant attention, keeping the engineering personnel fully employed. At the same time it is rarely necessary that shore assistance is required for repairs.

Particular attention is drawn to the necessity of having properly trained Diesel engineers placed in charge of the machinery. It has taken the East Asiatic Co. many years to attain their very satisfactory position as regards engineering personnel, and a long course of training is given every technical employee of this company.

AVIATION.

PACIFIC AIR ROUTES.

Source: Reliable.

2 February 1920.

(7424)

The author of this statement has had over 400 hours in the air and claims familiarity with Asiatic air route.

Following are quoted extracts of an interview with an American Army officer. I am familiar with many types of aircraft (heavier than air) and have traveled over the tentative route mentioned by the commission organizing the first aerial derby around the world and would like to point out after giving careful consideration that the whole thing does not present any new danger to the "seasoned airman."

The only unexplored airway being the Pacific Ocean and South China Sea, and if the pilot gave a very careful thought to his forward arrangements, such as machines, engines, equipment, route, seasons, space, and repairs, he ought to get through with success.

Season: Starting from America in early May the pilot should make his "jump-off" from Vancouver flying north to the latitude of Dawson City, where he should have his final engine test before attempting a continuous flight to the Aleutian Islands. He would be continually crossing the Northern Pacific Ocean trade route and the North American Revenue Cutter Service could keep a ready ear to its wireless telegrams. According to meterological findings in this season the air is clear and temperature would not be unbearable flying at a height of 12,000 feet.

Once at the Aleutians the worst is over. I feel certain the many Pacific steamship companies would endeavor to see that no difficulty would beset the pilot should he have to effect a false landing between the Aleutians jump-off and the eastern extremity of the Russian-Japanese coast.

On arriving in Japan the Government could assist with repairs, see the pilot well off and over to Shangahi, China.

Dropping down the coast of China via Foochow, Amoy, Swatow, Hongkong. At the latter place the pilot would approach with caution by the lay of the land, I should say "air bumps" would be good and hard, clouds low.

From Hongkong the pilot would again make easy stages via Macao, Heihow, Haiphing in Indo China. At Haiphong he would find quite useful "Drome" in the making, nearly opposite the town on the south river bank. From Haiphong he could make a short flight to Hanei from where he could jump off to Saigon. Before leaving Saigon he should make absolutely certain of his engine. The coast is difficult but the French authorities would render him every assistance in which case the jump-off for Bankok, Siam, would be effected with a small amount of risk.

At Bankok the pilot finds himself on the beaten track and should make for Penang in the Federated Malay States, or could make Singapore in the Straits Settlements. At either place he would have very little difficulty in picking out the race course for an excellent landing and from there could fly up to the Malay Peninsular via Kuala Lumpa, Taiping to Penang. The Straits Govenment would furnish him an efficient map. The country is difficult and hilly and very big "heat bumps" would be experienced. A good altitude should be maintained.

From Penang he could jump-off for the Tavoy Island, refuel, and make Rangoon in Burmah. Easy stages could again be effected via Akia Sanger point to the race course in Calcutta. Arrived at Calcutta the pilot could settle himself to good easy straightforward flying. Should he have engine trouble a very proficient mechanic could be got on the spot in a day or so, there being depots of the British Royal Air Force at various points.

From Calcutta, the pilot would then have many optional routes. He could almost make a tour of the principal cities across "Bengal and the Punjab," heading all the time for his jump-off from Karachi on the Arabian Sea.

There would be some care needed in the flight from Karachi to Bunderabas in Persia. The country is bad and the inhabitants rather antagonistic. A good engine overhaul, a thorough test, and it ought to see him over that hurdle.

From Bunderabas to Bushire would be quite easy going; he could hug the coast. The British Navy is very well represented in those waters.

From Bushire he could make Foy Aberdan and Basreh. The pilot should be clearing Basreh at about early September, and would have to take particular care in flying up the Tigris to keep at a good altitude. Sandstorms are frequent, but as far as it has been ascertained the storm never travels above 9,000 feet.

The Tigris flight would be made in small two-hour flips, Basreh, Kurnah, Kut-el-Amara, Ale-Garbie, Kut, to Bagdad in Mesopotamia. All along the route the pilot would find willing hands to help him on his way.

From Bagdad onward the pilot has two routes open to him: He could either make a jump for the coast via Damascus and Beirut in Syria, and follow it up to the French Air Station in Syria, or he could follow the railway to Allepo and jump off from there to Alexandretta. Should he decide the former suggestion the French authorities would give him every assistance across the Syrian Peninsula to Chehak, Turkish territory.

The pilot should then have no trouble in making a "route de lux" through Turkey, Bulgaria, and across the face of Europe to Paris. He would find along the way a chain of old aerodromes, used in the strenuous days of war, and new aerodromes. The latter are in the excellent hands of the authorities organizing the "Rome to Tokyo" flight.

VISIT TO UNOCCUPIED GERMAN TERRITORY.

Source: Reliable.

(9220)

21 April, 1920.

Under authority of the force commander's orders of 15th March, 1920, S-2, and with the permission of the Navy Department, I proceeded to Coblenz, Germany, and arranged with the commanding general of the American Army for entrance into unoccupied German territory: A pass signed by the chief of the German commission at Coblenz and G–2 of army headquarters for visiting Friedrichshafen and Berlin was given me. The chief of the German commission arranged an appointment with and presented me with a letter of introduction to Director Colsman of the Luftschiffbau Zeppelin, Friedrichshafen.

The object of my visit was to determine the methods of erection and the type of equipment used by the Zeppelin Co. in the construction of airships, so that recommendations could be made as to the similar requirements for Fleet Airship No. 1, which is to be assembled at the Naval Airship Construction and Experiment Station, Lakehurst, N. J. The report on the method of erection and type of equipment used by the Zeppelin Co., with recommendations and other technical information obtained, will be made the subject of a separate report.

I visited the cities of Heidelberg, Darmstadt, Baden-Baden, Konstanz, Friedrichshafen, and Berlin. I inspected the following plants and stations controlled by the Zeppelin Co.:

> Luftschiffbau Zeppelin, Maybach motor factory, Lowenthal station, Friedrichshafen; Zeppelin Hallenbau, Berlin; Staaken station, Staaken; Potsdam station, Potsdam; Ballenhullen, Berlin-Tempelhof.

The management of the Zeppelin Co. was very courteous, and the managers of the various plants took me on a tour of inspection and freely answered questions. The men, whose ages varied from 33 to 45 years, were very active and most enthusiastic about the prospects of commercial airships. The Zeppelin Co. controls plants for the making of all elements that enter into the construction of rigid airships, and at present there is at each plant a nucleus of an organization. No work is being done on airship work except at the Ballonhullen Berlin-Tempelhof, where they are making repairs on some moldy gas bags. Whenever the facilities of the Zeppelin Co. may be diverted to the manufacture of commercial articles, it is being done. At Friedrichshafen the foundry is producing aluminum kitchen utensils. The Maybach Motor Co. is producing a Maybach automobile engine and is arranging their plant for a monthly production of about 200 engines. At the Ballonhullen Berlin-Tempelhof production is being diverted to the manufacture of linen, cotton, and silk articles. There is a scarcity in raw materials and fuel, but the managers are very optimistic in that they expect that by the time their plants are ready for production these necessities will be available in some manner. They are looking to America for assistance.

The plants of the Zeppelin Co. are arranged for a rapid and economical production and provide excellent working conditions. The structures are very economical in the use of steel and the shops are of a design which gives the maximum amount of space with the minimum amount of steel. All the plants of the Zeppelin Co. were constructed by their subsidiary company, Zeppelin Hallenbau, Berlin, manager Milatz. It is interesting to note that the station at Staaken, which consists of two construction sheds and aeroplane factory, was built and the first airship was on her trials within the period of one year.

The facilities now controlled by the Zeppelin Co. can produce ships similar to the *L–72,* one in every 14 days.

The quality of workmanship was excellent. I inspected the apprentice school for the Maybach plant, and it is therefore evident how they produce excellent motors. They train their own men to the degree of accuracy required for the manufacture of their product. The apprentices are trained for the first year in a process and method shop. No production is required. They are taught how to use the various hand and machine tools and to work out practical problems of fitting, etc. The next three years they are in shops on production. At all times they are under competent practical instructors and their shopwork is supplemented by theoretical work.

To retain these men after they are trained, a good wage is paid, adequate housing provided, as well as hospitals, etc. Zeppelinhof, an industrial village adjacent to the Luftschiffbau Zeppelin plant at

Friedrichshafen, is an excellent example of a modern industrial village. The manager states that only by providing satisfactory housing facilities were they able to retain their employees. The prewar wages for first-class mechanics at Friedrichshafen was 10 marks. At the present time it is 35 marks.

At Friedrichshafen I inspected the *Bodensee*, *Northstern*, and *L–72*. These ships are ready for flight except gas-cell installation. I was informed that the Peace Treaty Commission will not permit of flight until after 10th July, 1920, and the management believe that they will not be permitted to resume flights on that date.

The terms of the Peace Treaty require that Friedrichshafen and Staaken be torn down and proportioned to the Allies. It is believed that if they are dismantled and again erected by the Allies that new plants could be put up for about the same expenditure of funds. The treaty also provides that seven airships be delivered to the Allies, but they were destroyed.

The British air ministry appears to favor this plan; Let Friedrichshafen and Staaken remain and permit the Zeppelin Co. to build simultaneously three ships of the latest Zeppelin commercial design until all the destroyed ships are replaced; two of the ships to be delivered to the Allies and one for a German commercial company. The Allies are to have overseers present during the construction of the ships and therefore will be able to obtain engineering information. They believe that, if Friedrichshafen and Staaken are destroyed, the Zeppelin Co. will sell their engineering information to an American or Japanese firm, and, therefore, it would not be available to them. Col. Hensley has been in Germany and has taken many flights in the *Bodensee*. It is rumored (British intelligence report) that Col. Hensley furnished the gasoline for the *Bodensee* flights and represents American commercial firms. I investigated these rumors about Col. Hensley's activities and found them to be erroneous. The Zeppelin Co. informed me that Col. Hensley has made temporary arrangements with them for the training of Army pilots; up to the present time I have been unable to find out the terms. Col. Davis, military attaché, American Trade Commission, Berlin, states unhesitatingly that there is no truth in the rumors about Col. Hensley. Mr. Doer, director of the Zeppelin Co., states that after the armistice, they wrote to the Hague asking for the names of American firms who would be interested in airships. The Goodyear Tire & Rubber Co., Akron, Ohio, was suggested and negotiations were conducted by one of the Goodyear European representatives.

The directors of the Zeppelin Co. were all keenly interested in airships and hopes to be able to carry out the will of Count Zeppelin; that is, to have airships navigate the world. They realize that, in order to have this accomplished it must be an international affair

and they are, therefore, very anxious to get foreign capital—especially American—interested in their proposition. Their tentative plan at present is to have large stations at Friedrichshafen, Cadiz, Spain, and in the United States, somewhere near the New Jersey coast. Large ships are to operate between the United States and Cadiz; small ships similar to the *Bodensee*, or land and sea planes to distribute the passengers from these points to the more important cities.

The Zeppelin Co. invites Commander Hunsaker, C. C., U. S. Navy, to visit their plant at Friedrichshafen and to confer with their engineers about the design of airships. Baron Gemmingen, president of the Zeppelin Co. and nephew of Count Zeppelin, desires to discuss with him the count's ideas on airships.

At Staaken I saw under construction an all metal monoplane—spanned 32 meters, width 4 meters, maximum depth of girder 60 centimeters, no struts, gasoline tanks in wings, speed 190 kilometers per hour, landing speed 90 kilometers per hour, four 260 Maybach engines mounted in the wing; to carry 18 passengers at 100 kilos each and 5 members of the crew, duration 6 hours.

The chief engineer of the aeroplane factory at Staaken, Mr. Rodbach, and the manager, Mr. Roach, will be very glad to confer with Commander Hunsaker. The monoplane is expected to be on trial in July.

General Director Colsman, manager of all the plants, Director Doer, formerly manager at Staaken, Director Milatz, manager of the Zeppelin Hallenbau, are sailing from Genoa, Italy, on 4th May. They are taking with them information relative to their plants and drawings of their airships sheds. They intend to call upon American capitalists to discuss commercial airships. I am informed that the Goodyear Tire & Rubber Co. has an option on their proposition. These men also expect to call upon Army and Navy officials. I am returning to the United States on the same steamer in order that I may be able to get more information and to keep in touch with their commercial dealings. It is believed that if there is a final agreement reached between the Zeppelin Co. and the Goodyear Tire & Rubber Co., there should be a clause in the contract whereby the U. S. Navy may have access to the information at a reasonable price.

I wore civilian clothes during my visit and had no difficulty in traveling, nor was my pass examined. The industrial men with whom I talked were very anxious to get to work and were looking to America for financial aid.

There is some scarcity of foods like sugar, eggs, milk, and butter, but the population seem to be well fed and clothed. Every available inch of ground was under intense cultivation with prospects of a good crop. It is generally believed that, if they can get sufficient food for

existence until the present crop is harvested, they will have no fear of the Red movement spreading.

The Army intelligence reports, Coblenz, indicate that the Red movement in the Ruhr district is rapidly dying out. The better elements have long since returned to their homes and there are only disorganized bands of the riffraff of the population going about looting. These are rapidly being captured. The chief of the German commission at Coblenz stated to me the reason for the trouble is in the Ruhr district. The Government was unable to provide the people with food, and the Reds offered 65 marks a day for soldiers and promised food. The people were hungry and they flocked to the "Red standard." When the "Reds" failed them food they disbanded and returned home. A similar occurrence may occur in Germany in places where food is scarce.

AVIATION IN HOLLAND.

Source: Reliable.

13 April 1920.

(9631–A.)

The military aviation center of Soesterberg is the most important one of Holland. The equipment, both military and technical, of this post is of the most modern sort and the operation of the camp is based on the most up-to-date principles. The entire camp, as well as all its dependencies, is under the command of Capt. Hardsberg. The military and civilian population employed at the camp numbers more than 500 persons. This population includes about 500, the majority of whom are civilians, besides several companies of engineers. Both civilians and soldiers sleep in the camp. Large and commodious shops are provided at this camp and include construction, repair, and assembly shops for both motors and planes. Electric power and lighting is provided by the electric power plant at Amersfoort. A complete wireless station, a very well-equipped photographic laboratory, naval searchlights, and a carrier-pigeon detachment are also installed at this camp.

Machines—School—Instructors—Gasoline—Munitions.

Machines.

Following is a list of machines at Soesterberg:

Eighty school machines of Spyker-Wynmalen type, built at the Trompenburg works in Amsterdam. All of these machines are biplanes carrying 80-horsepower, 9-cylinder motors of the Thulin-Swedish Thone and Gnome type.

Five English Haviland machines (type H). It is thought that these machines are at present known as the "Avro" airplane. They are all two-seater biplanes with 250-horsepower motors.

Two Bristol two-seater biplanes, 275-horsepower motor.

Three Sopwith two-seater reconnaissance biplanes, 110-horsepower Rhone motor.

Two Sopwith pursuit planes with 80 and 140 horsepower Clerget motors, respectively.

Munitions.

As this aviation field was organized during the war and at a time when materials for munition manufacture were scarce in Holland, the present supply of airplane bombs, machine-gun ammunition, etc. at Soesterberg, is of very inferior quality. The munitions that are available at Soesterberg were manufactured by the Minerva factory at Amsterdam and Antwerp. Types of bombs, bomb-throwing devices, etc., were copied from similar appliances found on interned planes.

Aviators' school.

Soesterberg is reserved for exclusive training of army aviators. The staff of instructors comprises 8 officers, who turn out about 60 finished pilots per year. The course for cadet aviators lasts one year

Gasoline.

Tanks with a total capacity of 5,000,000 liters are provided at the aviation field.

Note.

To the number of aeroplanes which are at present at Soesterberg are to be added at least 20 Rumplers, the use of which has been forbidden by the Government because of the weaknesses of construction, which render these machines very dangerous. There are a few other German machines in the same class as the 20 discarded Rumplers. In the case of the Rumpler machines, two or three accidents resulting in death have recently occurred by failure of the gasoline pipe at a point a few inches from the carburetor. In every case the failure of this pipe resulted in the machine catching fire.

It is reported that there are several Fokker machines which have recently been purchased and which will be sent to the aviation field at Soesterberg.

Future Planes for Soesterberg.

As Soesterberg is at present outside of the new water line, it is being seriously considered among Government circles to transfer the new aviation camp to Schellingwoude near Amsterdam.

Although the material in use in the Dutch naval and military air service is not of the most up-to-date or best type, the Dutch pilots, on the contrary, are certainly very good. They are not stunt performers in any sense of the word, but their performances give the impression of very capable, well-instructed pilots. Their value is

the result, to a great extent, of their method of instruction and because during the war their geographical location permitted them not only to see many of the various types of aviation equipment used by the belligerents, but also to study at close hand the results attained in the various air services. In addition, during the war aeroplanes of the Bristol, Sopwith, Handley-Page, De Haviland, Farman, Nieuport, Breguet, Spad, Henriot, Codron, Rep, Fokker, Aviatik, Rumpler and Phalz types were interned in Holland at various times, and were reconstructed and used by the Dutch air service.

Dutch pilots can be considered as being among the very best in landing machines. Their available landing spaces are all very small and consequently they have been carefully taught to make landings in very small fields.

Naval Aviation Camp at De Kooi.

In spite of the fact that the naval aviation depot instructs men only for the naval air service, the school does not possess a single hydroplane. The field as well as its dependencies is under the orders of Maj. Vreede. The organization and equipment of the field is of the most modern, and installed according to the best known methods. There are eight hangars at the field, each one of which has a capacity of 120 machines.

The field is equipped with repair depots as well as storage places for extra motors and planes. There is no wireless telegraph station established at the naval aviation center as yet. The aviation field at De Kooi is equipped with the following machines (1 March, 1920):

Twenty-five Spyker, 6 Fokker, 6 Thulin (reconstructed), 1 Curtiss as well as a few other machines of German make, information on which has not been secured to date.

Instructors.

There are 12 instructors at the naval aviation field: 6 commissioned officers and 6 noncommissioned officers. In general, these instructors are not as capable as those on duty at Soesterberg.

Naval Air Stations.

The naval air stations where hydroplanes are stationed at present are:

Molke,
Texel,
Schellingwoude.

Between the above-named places some 25 Brandenburg hydroplanes are distributed. These machines are constructed by the firm of van Berkel & Co., of Rotterdam. In addition to the Bran-

denburg machines, there are a few Glen-Martin hydroplanes carrying 200-horsepower, six cylinder motors.

The above stations are commanded by Lieut. Dormann, of the Navy.

Searchlights.

The above aviation fields are equipped with a certain number of English-made naval searchlights. The exact number located at each place is not known. They have a maximum range of 3 kilometers.

Antiaerial Defenses.

Outside of the few Maxim machine guns on both mobile and fixed mounts, Holland does not seem to have much antiaerial equipment.

Future Plans for Dutch Aviation.

It is reported from various sources that the Dutch Army and Navy are buying English and Italian aeroplanes and seaplanes. They have already purchased and accepted, in addition to the machines heretofore mentioned, over 100 Fokker machines which were made in Germany and smuggled into Holland. These machines are for the most part, two-seaters of the D–7 type.

General Notes Concerning Aviation.

The firm of van Berkel at Rotterdam has at present some 40 hydroplanes of the Brandenburg type under construction in their shops. The work on these machines is directed by a German engineer from Friedrichshafen. The Trompenburg works at Amsterdam, which turns out Spyker motors and aeroplanes, have given up the construction of aeroplanes, but continue to trade in foreign aeroplanes and motors. Wynmalen, the director of the Trompenburg firm, has been trying to have a combination with Fokker but failed. He is now trying to buy aeroplanes in England and to equip them with a Maybach motor and sell them to the Dutch Government.

DUTCH ARMY—ALARM AND DEFENSE AGAINST AIR RAIDS.

Source: Reliable.

2 April 1920.

(13016)

The following general scheme for alarm and defense in case of air raids has been obtained from an officer of the Dutch Army, military aviation section:

When mobilization takes place, the military authorities will determine the measures of resistance and protection to be taken against

air raids, and also the measures to be taken to limit the effects of such raids.

The police and fire brigades are subordinated to the military authorities in districts in which the latter are in control.

The civil authorities will be duly consulted in respect of all preparations in this connection.

It will be possible for air raids to be directed against important centers of population with any military establishments that may be situated therein, and also against factories, railway junctions, warehouses, docks, etc.

In view of the fact that it is not possible to be in constant readiness in the threatened objectives to meet an air raid with all available means of resistance, provision will be made by organizing a military air-guard (alarm) service in connection with which megaphones will be employed, to insure that on the approach of danger the measures necessary to bring about the state of preparedness are taken as speedily as possible. Measures will also be taken to limit the effects of an air raid as far as possible by means of a well-organized fire-brigade, life-saving, and first-aid service.

In order to render orientation difficult for the enemy, efforts will be made to give a misleading appearance to a town or other objective that has to be protected, so that the most important points can not be recognized. This affects more particularly the lighting of such places.

A further measure for the protection of important objectives consists in increasing the capacity of resistance against the penetrative force of bombs.

When warning is received of an air raid, measures will be taken to clear the streets of people without causing a panic. These measures will be set forth in public announcements and police regulations and will be carried into effect at the following three signals, which will be given by the police:

A signal *A*, at which all the inhabitants have to go to their houses, to be given as soon as it is possible to judge with a fair amount of certainty from the course taken by the aerial forces, the places they pass, etc., that the objective will be reached within 30 minutes or an hour;

A second signal *B* to be given about 15 minutes before the attack is expected to begin, at which all vehicular traffic must be stopped;

And a third signal *C* to be given when all danger is past.

For the aforementioned military air-guard service, air-guard stations will be established all over the country. These will report direct to a few central air-guard bureaus the passing of enemy airships and flying machines. These bureaus will compare the tele-

phonic reports received with one another and will go into the questions of whether an air attack is really to be regarded as imminent, against what place it will be directed, and at about what time the enemy air forces may be expected to arrive there.

The air-guard stations are divided into two categories: Alarm stations and observation stations. The former are intended to detect enemy aircraft and to report them at the appointed place. The observation stations serve to furnish artilleristic information to the nearest military commander.

It is the duty of an air-guard bureau—

1. To issue warnings as soon as the presence of a large force of enemy airships or flying machines above our land or sea territory is signaled.

2. To send warnings to all important places threatened by an attack from the air and to furnish them with all special information necessary in connection therewith.

Quick-firing guns are to be mounted on fixed concrete emplacements in the vicinity of important objectives which it is necessary to protect under all military circumstances. Each antiaircraft battery has one or more machine guns for the purpose of fighting low-flying aeroplanes, while as a rule there will be a pair of searchlights placed in the immediate neighborhood to render firing possible in darkness.

Places of minor importance are only protected by revolver cannon and machine guns.

The mobile antiaircraft artillery is mounted on motor lorries of special construction whereby the artillery is enabled (at all events in districts where the roads are sufficiently wide and hard) to move rapidly from place to place and to come into action at threatened points. Owing to the extensiveness and nonlocal character of its sphere of action, this artillery is intended more especially for use with the Army in the field and serves first and foremost to prevent enemy flying machines from taking artillery observations and to impede them in the making of tactical reconnaissances in front of or above our positions. It further serves to protect important tactical or strategical points in or near the actual fighting zone and in the zone of operations (general headquarters and staff headquarters, railway bridges, magazines, etc.).

Moreover, a number of field batteries are provided with the necessary appliances to enable them to be employed when needful to reinforce the special antiaircraft artillery.

To that end the guns are mounted in specially constructed wooden frames which are carried with the batteries for that express purpose, and are fitted with sighting apparatus (richtmiddelen) to enable them to fire at flying machines.

All the batteries intended to be employed for the purpose indicated are furnished with aeroplane detectors (vliegtuigzoekers) to enable them to determine the exact moment at which barrage fire against aircraft must be opened at night. This barrage may be produced in different ways; it may consist of flat layers, as it were, lying parallel one above the other, or it may take the form of a climbing spiral. The method of "oblique fire" will always be made use of for such firing, and in connection with so-called "aimed fire" in daytime also that method will be employed exclusively.

THE DEVELOPMENT OF AERONAUTICS IN JAPAN.

Source: Reliable.

(9318–C.)

In 1911 flying was first introduced into Japan as a military possibility, during which year two Japanese aviators returned from France after a course of study in that country. From that time on aeronautics in Japan has received more and more attention, and a number of civilians, as well as military men, from time to time, went to other countries, principally France and Italy, for training and returned to take up the profession here. A great many things, however, served to prevent a rapid development of the art. First of all there were no facilities for properly caring for the machines, consequently the machines were not kept in the best of flying condition, and they soon became unsafe for exhibition flying. After a few attempts these civilian flyers were obliged to give up the profession. Then again the topography of the country is very rugged, and practically all level land is devoted to paddy fields and divided up into small plots, each surrounded by small ditches and dikes, making landing places for land planes very scarce. So far, therefore, there has been very little civilian flying, although foreign airmen, with their own equipment and mechanics, have from time to time given exhibition flights. Two years ago a demonstration was given by two American aviators at Nara, in this consular district, which arrested some little attention.

Military Aviation.

In the two years following the return from France of the first two Japanese aviators five more flyers were added to the corps, and in 1913 an additional three. After that more attention was paid to the science of flying as a military accomplishment, and a training school was established near Tokyo which turned out several flyers every year. During the 1918 session of the Diet it was decided to open a new military aviation school in Fukuoka prefecture on the island of Kyushu.

Last year the army fleet of planes consisted of about 40 machines, and an airship, most of which it is said were of the Morris-Farman biplane and Newbolt monoplane types, developing a maximum of about 75 horsepower. This equipment, which is partly obsolete, is probably one of the causes of the great number of accidents which occur among Japanese flyers, as well as creating a tendency to dampen the spirits of some who otherwise would be more actively pushing the development of aeronautics in Japan. The authorities evidently are realizing the need of better equipment, for in 1917 several good machines were purchased in Europe, and during the past year, in order that the Japanese military air forces might keep pace with the latest developments in the science several French aviators have given instruction to native flyers.

That more active interest is being shown in military aeronautics is also evident from the fact that in the 1918 session of the Diet yen 1,540,000 was appropriated for the expansion and improvement of the military aviation service. A much larger program was mapped out, including plans for a big aviation station which will probably be located on Lake Biwa, in this consular district, to cost about yen 7,000,000. This program also includes the equipping of the Tokyo Arsenal with a plant for the manufacture of airplanes, and calls for completion of the plans and construction by 1924.

Although it is evidently the aim of the government to build its own planes, there have recently been purchases of machines in Europe. No statistics as to the present fleet of any planes are available, but it is believed among the Japanese that these purchases number between 40 and 50, and it seems likely that still purchases are likely to be made, which will give Japan a small army of modern planes. Apparently, therefore, there is a market in Japan for American manufacturers who care to compete. Interested firms should correspond with the aviation bureaus of the army and navy departments, Imperial Japanese Government, Tokyo.

A military tournament is planned to take place in Settsu Province, in the Kobe Consular District, early in November and it is expected that 36 planes, belonging to the Osaka, Himeji, Zentsuji, and Okayama Divisions will participate, making the aeronautic feature one of the chief attractions.

Naval Aviation.

The beginning of the naval aviation service was in 1912, the year following the inauguration of the military service. The first station was an experimental one, which was established at Oppama, but others are now in operation and in course of construction. It was not until 1916, however, that the naval aviation corps, as a unit, was organized. The machines used are principally of the Farman

hydroplane type, which, including the motors, were built by the government. The number of flying officers in the naval service in 1918 was about 50, compared with 70 in the military service. The present program calls for the construction by 1923 of 120 machines, as compared with 240 to be built for the army by 1924.

Apparently, more progress has been made in the line of naval aeronautics than military. The longest flight made in Japan was accomplished on 26 Septmber, 1919, when three planes flew from the naval base at Kure to Sakai, a distance of 230 miles. The machines used were one Samson type and two Hispano-Suiza, and the speed averaged between 60 and 70 miles an hour.

Civil and Commercial.

There is at present practically no civilian flying in Japan, although there are a number of civilians who are able to handle machines, having learned the art in foreign countries and a private school near Tokyo. The cause of the many accidents among Japanese flyers does not seem to lie in the inability of the fliers to grasp the principles of flying, nor the lack of technical knowledge or application, but more to lack of able mechanics. The military authorities are trying to overcome that difficulty, however, and sent a number of men to Italy for the purpose of studying practical airplane mechanics. This commission has recently returned, and with their aid it is hoped to produce mechanics better able to cope with the situation.

Although it can not be hoped that in the near future there will be much development in the use of the airplane for transportation, other than military and naval, in Japan the department of communications is contemplating an experimental mail flight from Tokyo to Osaka, a distance of about 250 miles. The authorities are encouraging civilian aeronautics and this mail flight, although to be under the supervision of the military aviation service, will be in the nature of a contest between military and civilian fliers in which two of the latter are already entered. This, of course, shows that the airplane is gradually being brought out as a means of rapid transportation, thus opening up a field for future development.

Three aviation associations are organized in Japan, one a private aviation school. Their names and addresses are as follows:

The Imperial Aviation Service, Mitsubishi Building, Maurnouchi, Tokyo.
The National Aviation Society, Yoban-cho, Kokimachi, Tokyo.
Dr. Kishi's Aviation School, Tokyo-fuka.

There have at various times been rumors of the establishment of airplane factories with private capital, but apparently no actual production has yet been accomplished.

JAPANESE AVIATION NOTES.

Source: Reliable.

(9318-C)

On 9 April, the second aviation battalion at Kagamigahara (near Nagoya) engaged in a practice formation flight, three Farman planes, Nos. 244, 245, and 102, being used, with pilots Capt. Sato, Sergt. Maj. Takamaski, and Sergt. Ohashi.

Leaving Kagamigahara at 5 a. m., they landed at Kyoto at 7.15 a. m. for gasoline. Leaving Kyoto at 8.20 a. m., they flew over Osaka, Kobe, and the neighboring villages, arriving at Tokushima drill ground about 9.40 a. m. A great crowd had gathered near the landing place and the arrival of the planes was greeted by loud cheers.

Capt. A. Del Piano, of the Italian Army, arrived 6 April in the S. S. *Iwustrack* from Trieste, having been engaged by the Japanese Government as an instructor in aviation.

Lieut. Gen. G. Nagaoka, who has been inspecting the science of aviation in France and England, left London on the 1st of April to return home via the United States.

Col. Faure and members of the French aviation mission of instruction will leave Yokohama for home shortly by the Toyo Kisen Kaisha steamer *Shinyo Maru.* A farewell dinner was given in their honor at the Korakuen Garden, Tokyo, by Gen. Tanaka, minister of war. Among those present were Marshal Kawamura, Admiral Kato, minister of the navy, Baron Shibusawa, Baron Sakatani, and Mr. E. Kamada, president of Keio University. The host, in expressing appreciation of the good will of the French Government shown in the sending of Col. Faure and his staff to Japan, thanked the colonel and his other officers for their zeal in promoting the efficiency of the Japanese military air service. The recent successful flights by several Japanese military officers between Tokorozawa and Seoul were due to the untiring instructions of the French airmen.

MANUFACTURE OF AIRPLANES AND TRAINING OF AVIATORS.

Source: Reliable.

16 April 1920.

(9318-C)

A 3,000,000 yen company for the manufacture of airplanes and training of aviators—Capt. Inoue and Mr. Oguri attempting to form the company—is now under consideration.

There is great activity at present in army and navy aviation and civilian aviation as well there are many who are earnestly planning for further expansion. In civilian aviation circles, the most pressing

question is the selection of suitable aviation grounds and a good site for an aeroplane factory. There is money available for the purpose and in accordance with the plans of the war department, Capt. Takesaburo Inoue has been engaged in a study of the proposition under the direction of Prof. Sashi. At present, Capt. Inoue is very busy with plans for the organization of a 3,000,000 yen company for the manufacture of aeroplanes and the training of aviators. His plans should be announced soon. With the same idea in mind, Mr. Tsunetaro Oguri has leased a site in Susaki, and when his biplane tractor is completed, at Tokorozawa, will commence the manufacture of aeroplanes, together with the training of fliers, on his favorite Hall-Scott, 120 horsepower, and other machines.

FRENCH COMMERCIAL AVIATION.

Source: Reliable.

14 April 1920.

(13055)

The French commercial aviation is under the control of the "Directeur du Service de la Navigation Aerienne." This service is under the "Sous-Secretaire d'Etat de l'Aeronautique et des Transports Aeriens."

The Government does not manufacture airplanes, but purchases them from private manufacturers.

The Government does not subsidize the aeronautic industry but encourages it by sending missions to foreign countries to acquaint them with French matériel.

The Government is at present training in its aviation schools a certain number of foreign military student-pilots. The high cost of this training will oblige the Government to request reimbursement for part of these expenses.

Up to the present time the French had exported very few airplanes.

The French do not import any aviation matériel.

Paris and London aerial transport tariffs are as follows:

Passengers with 15 kilograms of baggage, one-way trip	francs	600
Excess baggage per passenger (above 15 kilograms)	per kilogram	6.50
Merchandise:		
1 to 5 kilograms	francs	10
5 to 10 kilograms	do	8.50
10 to 20 kilograms	do	7.50
Above 20 kilograms	do	6.50

Tarriff for Mail Transport by Airplane.

In France.

The following table applies to letters and parcels when they do not go out of France (Corsica included). This table shows the

additional postage to be paid over and above the regular postage rates:

Distances.	Weight of parcels and letters.		
	Up to 20 grams.	Above 20 grams up to 100 grams.	Above 100 grams up to 200 grams.
Up to 500 kilometers	0. 75	1. 50	2. 25
Above 500 kilometers and up to 800 kilometers	1. 00	2. 00	3. 00
Above 800 kilometers	1. 25	.....	.....

Between France and Morocco.

The following table of additional postage applies:

Distances.	Weight of parcels and letters.		
	Up to 20 grams.	Above 20 grams up to 100 grams.	Above 100 grams up to 200 grams.
Up to 500 kilometers	0. 75	1. 50	2. 25
Above 500 kilometers, up to 800 kilometers	1. 00	2. 00	3. 00
Above 800 kilometers	1. 25	2. 50	3. 75

Between Paris and London:

The aerial postage rates between Paris and London include—

(1) The international postage.

(2) A tax for the profit of the country of origin, calculated at 3 francs per 20 grams or fraction thereof (or 2s. 6d. per English ounce).

The official aerial traffic in France is assured by 67 airplanes and 33 pilots.

GERMAN DIRIGIBLES AND AIRPLANES EXISTING AT THE END OF THE WAR.

Source: Reliable.

9 April 1920.

(11969)

Information received from a member of the French Section of the Interallied Aeronautical Commission of Control.

At the time of the armistice there were 14 or 15 dirigibles in Germany. The Interallied Commission found only six. The others have been destroyed. The Germans state that the destruction of these was due to carelessness on the part of the caretakers. All the dirigibles that have been destroyed were of a later type than the *L–49*, which was taken by the French at Bourbonne-les-Bains in

October, 1917. Therefore nothing very new can be obtained from the dirigibles to be turned over to the Allies. The Germans are repairing as quickly as possible the six remaining dirigibles, viz.: the *L–37*, *L–72*, *L–71*, *L–30*, *Lz–113*, and *Lz–120*. They are practically useless.

Regarding hangars, it is thought that there are very few useful ones outside of those for the Bodensee and Nordstern. Many military airplanes have been disguised as civil airplanes and shipped to neutral countries. Many remain in Germany. There are 100 at Johannisbad, 300 at the Fokker factory in hangars kept warm and ventilated, and many scattered lots of two or three planes throughout the country in the care of unknown mechanics. The German military airplane has a safety factor of rarely greater than 5, and is therefore dangerous for civil use.

The work of the Interallied Commission is extremely hampered by false information furnished by the Germans, by lack of coordination among the allied officers themselves, and by the fact that many members of the commission are not competent and not specialists in the particular duty which they try to fulfill. Gen. Masterman, head of the commission, has confidence in about only 10 members of the commission. The cause for existing conditions is due to the long delay between signing of the armistice and actual functioning of the Aeronautical Commission.

THE NEW FOKKER AEROPLANE.

Source: Reliable.

23 April 1920.

(6173)

On Saturday last, in a salon of the Hotel "Twee Steden" at The Hague, before a small number of invited persons, among whom, besides the Prince Consort, various civil and military authorities were present, Mr. Fokker, the well-known aviator, delivered a lecture with limelight views. The speaker said that in the first place the demands of modern organized air traffic can only be satisfied by aeroplanes; air-ships can never attain the speed that an aeroplane can develop nor are they ever so safe, not even with a landing, while also from a financial point of view, with regard to construction as well as working, they are much more risky machines. The only possibility now to insure the future of the aeroplanes in this country is that the military authorities should place as much money as possible available for this purpose. Also this should be done for ordinary aeroplanes, these being always in war time able to be converted into fighting machines. The speaker added that should this financial support not be forthcoming, he would be compelled again to

go abroad. In the meantime, many improvements will have to be introduced in the existing machines. For a modern aeroplane (and the speaker with this had in view his own newest machine) a speed of 300 kilometers per hour is required for ignition turbine motors, each in its own engine room; the monoplane system, the cabins under the wings capable of carrying six persons, and finally, silent motors. The speaker proposes, provided the Dutch Government will render the necessary assistance, to open a regular aerial service between Holland the Colonies, and between the islands of the Dutch East Indies.

With regard to water planes, the speaker is a great opponent of these and as a proof of their nonutility he showed a picture in which a German water plane fell to the water and sank. Besides this film, others were also shown, such as one of the latest German aeroplanes, the "Dornier," that was constructed at the Zeppelin works at Ludwigshafen.

The most interesting, however, was that of his own latest machine. The speaker stated that it was now ready and had made a trial flight from the grounds of the Spyker works at Amsterdam, and this flight was an excellent success. On the film Mrs. Fokker was seen stepping into the machine, while one of Mr. Fokker's cooperators, Mr. De Wal piloted it. The speaker stated that he is engaged with his first engineer, Mr. Scopic, in introducing some smaller technical improvements.

The writer of these notes says that from the information which Mr. Fokker gave at the above-mentioned lecture, he is able to add that Fokker's assistant, Mr. De Wal, has recently been engaged in making trials in landings at night. Mr. Fokker considers these of the utmost importance, with a view to any well organized service in the air, and anticipates very much from the use of wireless telegraphy in this connection.

AMPHIBIOUS TYPE OF SHIP AEROPLANE.

Source: Reliable.

20 April 1920.

(13054)

The following type of airplane was designed by Mr. Bolas, who is also the designer of the present standard type of ship plane used in the British Navy:

The characteristics and the estimated performances of this plane that were obtainable, are listed herewith:

(*a*) Type amphibious, ship airplane, land and water chasis, single float with wing tipped pontoons.

(*b*) Full load weight 4,500 pounds.

(*c*) Span, 36 feet.

(*d*) Endurance, 4½ hours at 10,000 feet at 100 miles per hour.

(*e*) Wing construction, steel ribs and spars with fabric covering.

(*f*) Engine, Napier Lion.

(*g*) Load per square foot of wing surface, 8.2 pounds (approximate).

(*h*) Guns, one Vickers for pilot; one Lewis for observer.

This machine will also be fitted with two parachutes, and it is understood that difficulty is being encountered in the rigging of these.

Unlike the Parnall Panther, which has a broken fusilage, the fusilage of this type is unbroken and will be made up of removable sections which it is believed will facilitate inspection. The wings of this craft will be of the folding type to facilitate storage.

Trials will take place in all probability during this coming June.

DIRIGIBLE DEVELOPMENT FOR OCEAN TRAVEL.

Source: Reliable.

(4856-B)

15 March 1920.

Count De La Vaux published an article on the future development of dirigibles for ocean travel. The article mentions the good results obtained by Italian dirigibles and the poor results of the Zeppelins as bombing raiders. The Allies considered the Zeppelins of so little value that on the signing of the armistice no request was made for delivering these.

On the other hand the Zeppelins rendered inestimable service to the Germans in reconnoitering.

In 1917 a Zeppelin travelled 7,000 kilometers in one flight from Bulgaria to East Africa and back.

In France, England, and Italy, smaller dirigibles were employed in defending transportation, and they have also made long trips without encountering difficulties. The French made frequent flights from Marseilles to Algiers and vice versa.

There is nothing new in civil service dirigibles, as a dirigible service existed in Germany before the war.

It would appear that Italy takes the lead amongst the Allies, and this is confirmed by the interest displayed in Italian dirigibles by both Americans and British, and particularly in the successful M. and O. types, of which one M. type was purchased by the latter and flown from Ciampino (Rome), to London.

Italy is now experimenting with a passenger dirigible.

ITALIAN AERONAUTICAL FEDERATION.

Source: Reliable.

(13056)

6 April 1920.

There is being organized in Italy a National Aeronautical Association to include all aviator observers, inventors, and constructors who were actively associated with aviation matters during the war. The object is to give the country a complete and thorough understanding of aviation matters through a proper aviation journal within reach of all purses, and to put before the leading political and technical men of the country a clear exposition of the dual problem of military and civil aviation. It hopes to have considerable power for the following reasons:

(*a*) The moral force of its members who, for the most part, are men who actively participated in the war.

(*b*) The great technical ability of the engineers, constructors, inventors, students, technical directors, pilots, mechanics, fitters, observers, and gunners.

(*c*) Its antibureaucratic organization with a program for advancement and opposition to procrastination.

Several meetings of the provisional council have been held under the presidency of Cav. Celestino Usuelli.

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INTERNATIONAL.

JAPANESE ACTIVITIES AND CHINESE POLITICAL CONDITIONS IN SHANTUNG PROVINCE.

Source: Reliable.

(11919-A.)

24 January 1920.

Attention is invited to article entitled "What America's policy should be in China" in Monthly Information Bulletin of 15 May, 1920.

Introductory.

I left Peking on the morning of 3 January, 1920, and arrived the same night in Tsinan, from which place I started on my return journey to Peking on the morning of 7 January, having spent three days and four nights in the city.

The primary purpose of the trip was to secure all available information upon the strength of Japanese garrisons in the province, the distribution of their forces, the influence which they exercised through advisers and the like, and to get some knowledge of their military equipment and of communications which might serve a military purpose.

A secondary object was to cultivate the friendship of the Chinese provincial officials, to inquire into their relations with the Japanese, and to carry on among them in American interests such personal propaganda as might be of advantage to us.

A third and incidental purpose of my trip, in my own mind, was to find in the community some American with whom I could correspond upon my return—of necessity one who was well informed and took a sufficient interest in both Japanese and Chinese affairs to be able to send me accurate accounts of affairs in the province in future. In this object I was disappointed, for I found that in the business community, which was represented by two or three nearly all new comers and that the few exceptions were persons whom neither the Chinese authorities nor the American consul saw fit to trust. I found the few members of the missionary community, who pretended to take an interest in public affairs, so much out of touch with the local officials that their knowledge of them was gained only through prejudiced native satellites (native pastors, students, etc.), while their ignorance of the fundamentals of existing Chinese politics wholly unfitted them to pass judgment upon either men or events. What they had observed of Japanese activities

and of Chinese movements was accurate enough, but their judgment of motives and political causes was so pathetically at fault that their outlook upon the whole situation I found valueless.

Another matter which deserved and attracted my attention was the student movement which constitutes the inspiration for the anti-Japanese boycott and which is, in many respects, the most interesting and the most vital expression of new ideas in the Orient. Of this more later.

I arrived in Tsinan as an old friend of the civil governor of the province, and was received there, by appointment, by the American who had originally introduced him to me, Mr. A., whose knowledge of the Chinese language, of individual Chinese officials and of the intricacies of Chinese politics, is unrivaled in the country. Advised by Mr. A. of my coming, the civil governor, Mr. Ch'u Ying-kuang (to whom I shall refer hereafter for convenience as Chuyingkuang), was moved by a spirit of hospitality to give me the best possible impression of his capital and used all his influence with his official colleagues to make my visit not only pleasant but profitable. The secretariat of his office was put at my disposal and in compiling information, which is attached to this general report, every department of the local government exerted itself to the utmost. His private secretary, a Mr Hsu Tung-fan, whose usual duties occupy about 16 hours a day, was placed at my disposal to be of assistance in making official appointments and in gathering information, and to this gentleman I am much indebted for the facility with which I contrived to see and interview all persons in whom I was interested. The American consul, Mr. N. F. Allman, who, in spite of the usual Chinese observation that he is young, immature, and therefore not to be trusted with grave secrets of state, is in excellent official standing, was also extremely hospitable and helpful and put all information at his disposal before me, at the same time embarrassing me by requesting a division of my spoils in the way of information, which were usually given me with the explicit understanding that I was not to pass them on to him.

The conversations which my former intimacy with the civil governor made possible with him and other officials I consider the most valuable fruits of the trip, for they were largely upon Chinese-American relationships and were unusually frank, thanks to previous acquaintance and confidence. Popular report, even on the streets of Tsinan, which fails to take into consideration the difficult position of a Chinese official in a community which is a selected target for Japanese aggression, would have it that the civil governor, Chuyingkuang, the military governor T'ien Chung-yu (hereafter written Tienchungyu) and the occupation commissioner garrison commander, Ma Liang (lieutenant-general), are all Japanese ap-

pointees and Japanese agents and that they are callously indifferent to Chinese interests and are so dependent upon the Japanese paid officials in Peking that, whatever their individual inclinations, they are bound to support a pro-Japanese policy in Shantung.

Thanks to previous intimacy with the civil governor, I knew this to be an absolutely false impression in his case, and thanks to the confidential relationship which he established between me and his colleagues, I have every reason to believe that it is equally false in their cases also.

During the term of my visit the American consul made it possible for me to interview the president of the student's union, an organization of 4,000 members, and the editor of the most radical newspaper, so that my impressions were not wholly one-sided. My general impression was that the official element was whole-heartedly in sympathy with the radical element in its opposition to shameless Japanese aggression, but that responsibility of office restrained the former, while total lack of responsibility encouraged the latter to acts and expressions of thought which seriously embarrassed the former, who have to deal diplomatically with the Japanese, and that this difference of position had led to a difference of attitude which amounted almost to an open breach.

At an informal dinner at which the military governor, Tienchungyu, was the host, the civil governor encouraged his colleagues to a relation of anecdotes about their encounters with the Japanese, illustrating the indulgence with which the Japanese officials, consular, etc., sheltered and excused the peccadilloes of their riffraff constituency, and thus inspired, both Gen. Ma Liang, generally regarded in radical circles as a Japanese agent, and Gen. Tienchungyu launched upon a series of stories which in themselves constituted a more wholehearted damnation of Japanese policy in China than all the evidence which the United States Senate has yet had to consider in its debates upon the Shantung question.

As Civil Governor Chuyingkuang remarked, after prefacing the sardonic statement that he was a Japanese appointee to his present post, if the American people could know as much of Japanese doings in the Orient as these anecdotes brought forth, or as much as any foreign resident of the Far East has stored in his memory, the German outrages in Belgium would seem puerile and trifling in comparison. Gen. Ma Liang told on this occasion of the efforts which he had made to have a Japanese gambling house and a Japanese opium den, conducted under a full flare of lights opposite the entrance to the Japanese garrison in Tsinan, closed and of the excuses made by the Japanese commander that such institutions were essential to Japanese revenue and the defraying of local expenses—all in a Chinese community under Chinese jurisdiction. Gen. Ma also asserted that from

his personal observation he did not believe that the permanent Japanese population of perhaps 700, or of the total population of more than 2,000, more than 10 per cent were in legitimate business. Prostitutes, imported to corrupt Chinese morals, constitute a large proportion, he assured me, while among the storekeepers a very few who displayed signs advertising cotton goods, enameled wares, etc., had in their shops stocks of opium and morphine and the hypodermic syringes incidental to their traffic.

It was my particular effort in dealing with these various Chinese officials in group to avoid a discussion of international affairs but to ingratiate myself as far as possible and gain their confidence, for it must be understood that in China, where all are opportunists without policy or political ethics, much more can be accomplished through an appeal to friendship than through any citation of principles, and that a personal relationship between an American and a Chinese is much more likely to sway the Chinese in his judgment and actions than any national consideration or thought of policy. Of this the Japanese have taken full advantage.

Chinese Official Administration in Shantung.

Under the present system of administration the Chinese Province is governed by a Tuchun, a military governor, whose authority is supreme, who holds his position by virtue of his command over a certain number of troops, and besides whom such functionaries as the civil governor and the local military commanders are of little account. To this rule Shantung is now the exception. There are three men of power and influence in the Province who must be taken into consideration, all of whom are likely to exert more or less influence upon China's immediate future since Shantung is a point of immediate contact with the Japanese. Of these the civil governor certainly takes first place, both politically and by virtue of superior sagacity. Military Governor Tienchungyu comes second, though he has yet to declare himself in his new post, and Garrison Commander Ma Liang is an interesting figure who may easily eclipse the military governor in importance in any subsequent crisis.

Civil Governor Chu Ying Kuang is the youngest man of his official rank in China. He was governor of Chekiang Province at the age of 34 and now, at the age of 38, he has been deputed to sit upon what is generally conceded to be the powder barrel of China. For several years past he has been living in retirement in Peking, acting as an adviser upon southern affairs to Gen. Chin Yun-peng, the present premier, and to Marshal Tuan Chi-jui, the ex-premier and the grand controller of the northern military party which has been responsible for so many Sino-Japanese loans of evil repute.

Chuyingkuang came into office last summer as civil governor of Shantung at a time when the whole northern party was believed to

be committed to the advancement of Japanese ends, and was popularly regarded as a Japanese tool if not actually a Japanese appointee. His appointment was, however, secured through the influence of Mr. Pan Fu, a wealthy and intensely patriotic native of Shantung Province and through the influence of Gen. Chin-Yun-peng, now premier, who is a fellow townsman of Mr. Pan Fu and who has since made a feeble effort to organize among the northern militarists an anti-Japanese faction in opposition to the strong pro-Japanese element led by Gen. Hsu Shu-cheng, Marshal Tuan Chi-jui's favorite and most able lieutenant. Chuyengkuang took up his post as a suspected Japanese agent and in a few months, without the support of his constituency, which still suspects him, has been able to eject from the Province his superior, the military governor, Chang Shu-yuah, who was a faithful representative of the pro-Japanese Gen. Hsu Shu-cheng, and to have appointed in his place Gen. Tienchungyu, formerly governor of the semi-Mongal district of Chahar, governed from Kalgan. Chuyingkuang has undoubtedly sacrificed the support of the stronger element of the northern military faction under the leadership of the pro-Japanese Hsu Shu-cheng and if his sponsor, the present Premier Chin Yun-peng, falls from grace his position will certainly be precarious, but in the meanwhile, in spite of the popular conviction that he is a Japanese agent he is certainly making every effort to maintain Chinese prestige in Shantung where Japanese aggression, sanctioned by the terms of the Paris peace conference, has given Japanese agents all confidence and what they interpret as a free hand. He is not a man to make an open declaration of war upon Japanese interests or to openly avow any particular policy, but I have been convinced for years that he is one of the cleverest officials in China and I believe that in a subtle Chinese way he will prove to be one of the most dangerous enemies to Japanese interests in Shantung if he is permitted to hold office. His attitude toward both America and Japan is expressed in interviews which I had with him and which I shall report later on.

Tienchungyu, military governor, who assumed office 26 December, was to all intents and purposes Chuyingkuang's candidate for the office and will presumably act under the latter's direction during his tenure of office. Tien is a man of strength of character and great determination, amounting to stubbornness when he is crossed, but has no great intellectual attainments. He is regarded by the Chinese as a bluff and honest savage, who will serve as a strong instrument in the hands of such a consummate intriguer and diplomat as Chuyingkuang. The radical press heralds him as another Japanese employee, but I have heard him recite in a veritable sweat of emotion his encounters with Janpanese officials and nationals in his previous posts in Soochow and Kalgan, and have heard him

assert with the stubborn determination which is characteristic of him that they will make little profit out of him in Shantung, so I doubt if they will gain much through his assumption of office unless it is by provoking him to some act of desperation in which he will forget to be guided by Chuyingkuang's diplomacy.

Gen. Ma Liang is the commander of about 15,000 troops, belonging to the second division and a mixed brigade, elements in what is now known as the frontier defense army. This force as a whole is generally regarded as little better than a Japanese auxiliary force, and is looked upon with both jealousy and resentment by all military factions in both the north and the south. It was originally created as the war participation army, then, when the war failed to furnish an excuse for its existence, it became the national defense army, and still later, when Gen. Hsu Shu-cheng, serving Japanese interests, decided to use Mongolia as a field for further concession selling to the Japanese, and as a base for his control of the Peking Government, it became the frontier defense army.

Now, while Gen. Ma Liang is the commander of such an important element in this army, it seems very doubtful, indeed, whether he knows or cares anything about the political purpose behind its organization. He is a man of most peculiar temperament, understood by few; sincere in everything he does, he is much more easily led than driven. Tactless opposition drives him to a frenzy and prompts him to outrages which have made his name execrable in the ears of the leaders of the present popular movement, but on the other hand a very little flattery and cajolery makes of him a ready instrument, and this, the Japanese recognizing, accounts for most of the conduct which has branded him as pro-Japanese. He is very loyal to his friends, outspoken upon all subjects, and almost recklessly courageous in the face of any danger.

Gen. Ma Liang is a Mohammedan, 48 years of age, and is a native of Paotingfu, Chihli Province. He has held many high military posts and was for many years an instructor in the military academy at Paotingfu. The post of governor of Shantung was offered him by Yuan Shihkai in 1915 but he refused it, and it is generally conceded that he has no particular ambition, but takes more delight in military instruction than in anything else.

A hobby, which amounts almost to an obsession with him, is the revival of China's antique system of military training, which includes the native wrestling and boxing, still assiduously studied in Shantung, upon which the Japanese system of jiu-jitsu was founded. The man passing through his system of training is an expert wrestler and boxer, is expert in the use of such weapons as the broad sword, the saber, the lance, the halbert, the quarterstaff, and many other antique weapons peculiar to Chinese armament. Their agility and

physical endurance is remarkable and they test themselves by cracking paving stones on their backs and heads and by breaking bricks on their faces and between their fingers. This has to be seen to be believed and to impress me Gen. Ma held a review of several hundred of his men going through their exercises and tests. This show lasted for several hours, and a more amazing performance of skill and strength and endurance I have never seen.

As a result of 18 years' experience in such training Gen. Ma has compiled a number of books on his military and semimilitary drills, copies of which he presents to all who seem interested. In the last decade he has trained more than 150,000 men in these exercises and between thirty and forty thousand school children. The Japanese pretend to a great interest in this military "science" and have sent nearly every officer stationed in Shantung to witness his reviews and exhibitions, thereby gaining some hold upon Gen. Ma's regard. As he is supposed to be anti-American and to have cast in his lot with the Japanese, I went to Tsinan with the definite purpose of ingratiating myself with him and of seizing every possible opportunity to put in a good word for America. My enthusiasm for his system of training and my expressed intention of bringing some American officers to see his show made an impression upon him, and at a later conference I had an opportunity to discuss Mohammedanism sympathetically and at the same to lecture on international politics. Gen. Ma became so friendly on the basis of these talks that he finally confided to me that he had labored indefatigably for 20 years on his system of physical and military training in the hope that it might put a little backbone into the Chinese people and enable them to resist foreign incursions and aggressions and that he had consistently refused to teach any branch of it to the Japanese though he had received many requests for instruction. He said, however, that he believed America's friendship would be valuable to China and that the introduction of his "science" into our system of military training might serve to cement an alliance, so that he would be glad to undertake the solemn duty of instructing us in ancient Chinese tactics. He would take a hundred men to America if we liked and introduce it, or he would begin by initiating the American Legation Guard in Peking into the mystery of his teachings. I expressed great appreciation of this offer, which I could see was made with sincere enthusiasm, and said that an essential step toward introducing his teachings would be a visit from the military and naval attachés, so that they could view with their own eyes the marvels that I had beheld and in that manner be convinced of the genuine merits of his system. I promised to use all possible influence to have attachés visit Tsinan with me and witness the show.

Gen. Ma came to the railway station when I was leaving to hear me reiterate this promise and was pathetically eager and excited about it. I have not the slightest doubt that if I could fulfill this promise and if a few American officers were to go to Tsinan and enthuse over his show, Gen. Ma, whose influence among military leaders of the old school is great, would be inseparably attached to American interests and might prove a valuable ally in Shantung. Allowances must be made for his evident simplicity of mind, and it must be remembered that in him the Chinese do not see an eccentric faddist but an excellent scholar and an accomplished military leader of great courage and determination. He confided to me that he had the faculty of seeing prophetic visions and of interpreting his own dreams, which will probably afford some clue to the nature of his mind. In addition to what I have written of this man I can only add that he is fairly consumed with energy, that he sleeps four hours a day, eats a minimum of the simplest food, treats his soldiers as his "little brothers" but exercises an iron control over them. In the newspaper reports he is represented as the personal enemy of the civil governor and as a jealous rival of the new military governor. I had several opportunities of seeing all three together and of hearing discussions of business and policy, and, if I am any judge of Chinese, I should say that Gen. Ma is entirely ready to cooperate with both his superiors and will probably work exceedingly well with Military Governor Tienchungyu while Civil Governor Chuyingkuang finds Ma rather trying at times on account of his eccentricities, but will cultivate him and make use of him because of his standing among the older military men and because of his manifest ability to control troops.

Interviews with Governor Ch'u Ying Kuang.

I had several opportunities while in Tsinan to talk with Civil Governor Chuyingkuang. On one occasion he talked at some length upon what the Japanese were doing in Shantung, and at another time we had a discussion of international politics, of American policy, and of what American policy ought to be. I found the governor extremely well posted upon matters of foreign policy, with a clear understanding of Japan's purposes, and of what America's and China's national policy should be. His ideas upon these subjects coincided in almost every respect with my own, and I have embodied the whole argument in an article which I have entitled, "What America's Policy Should Be."

Gov. Chu expressed the hope that America would some time appreciate China's position in the Far East, and that she would adopt a consistent policy in support of China's best interests, at the same time making as much show as possible of power to gain the confidence

of the Chinese people and to impress upon them America's strength. He was particularly eager, he said, to see the American Asiatic Squadron in China waters as often as possible, and he hoped that the vessels of this fleet might some day visit Tsingtao, because the impression which such a movement would make upon the minds of the Chinese people would be great and would stimulate confidence in America. In discussing the American Government, he said that he had observed that the State Department, and all officials under its control, were conservative and that they failed to appreciate the significance of current events in the East and the importance of an American policy for the Far East. It seemed to him, he said, that the naval and military people whom he had met at various times not only had a better understanding of Japan's strategic position but were also readier to adopt a policy which would be of tangible benefit to both America and China in the East. When he later supplied me with certain definite information about the Japanese military organization in Shantung, he gave it to me on condition that it be used by the naval and military attachés in Peking only, and that it should not be communicated to the legation in Peking because that institution had shown on other occasions lack of discernment and discretion and did not any longer inspire him with confidence.

In his discussion of Japan's occupation of Shantung, Gov. Chu made the following statements:

Under the German régime in Shantung the railway guards on the line from Tsingtao to Tsinan, as well as the great majority of laborers, mechanics, and employees, were all Chinese. Since the Japanese have taken over, Japanese garrisons have been stationed not only in Tsingtao and Tsinan but at strategic points along the line as well, and the Chinese railway guards have been reduced in number and are now so complete under Japanese control that they are not permitted to approach the line at all and only view the railway stations from afar off. Mechanics and others have also been replaced by Japanese in great numbers. All along the line of the railway the Japanese exercise jurisdiction over the Chinese not only within the 30 li belt, which is known as the railway zone, but outside it as well. At the various stations along the line, notably at Poshan, the Japanese are acquiring much property, paying fair prices to Chinese landowners when the land is for sale, but forcing others to sell through persecution, and in some instances boldly confiscating land, especially where it is Chinese Government property.

Chinese bandits are employed by the Japanese and are given protection in the railway zone, from which they issue to commit many outrages, a favored employment being that of kidnaping Chinese property owners who refuse to sell land to the Japanese and holding them for such a high ransom that they are forced to sell out to redeem

themselves. Such persons, when not redeemed by their families, are invariably tortured and killed. Much of the property, especially mining property now being purchased by the Japanese, is bought by Japanese bad characters with the profits from the illegal export and sale of Chinese copper cash, in which traffic, while it is profitable, the outlaws were given the protection of Japanese officials and were afforded every facility for exporting the contraband over the railway.

Gov. Chu and Gen. Ma Liang have both gone carefully into the question of Japan's imports of opium into Shantung. Their agents have reported that the average import of opium into Tsingtao is 70 chests a month, which opium is valued in the Chinese market at $10,000 a chest. The value of the annual import would therefore be $8,400,000. A very large percentage of this opium is grown in Korea, the Kuantung leased territory, and in Formosa, while a small percentage is Indian opium reshipped from Japan. These shipments do not include the very large import of morphine, cocaine, etc., upon which Gov. Chu had no definite figures. The sales in Tsingtao through Japanese agents are not large. The bulk of the various poisons is sold by Japanese in small communities along the railway and in Tsinan, who get their stocks through the Japanese post offices.

In Tsingtao, Gov. Chu says there are 80 Japanese firms with a capital of more than $100,000 and between two and three hundred firms capitalized at various figures between $10,000 and $100,000. All of these, he says, are buying Chinese property not only within the concession, but in the surrounding country as well. Two wharves have been built and two more are planned, which when completed will take up the entire water front, so that no matter upon what terms Tsingtao is eventually administered, all property and public works will be in the hands of the Japanese.

Gov. Chu, like most Chinese, believes Tsingtao is lost because China could not, and would not, pay the exorbitant price which the Japanese would put upon their property holdings and their public improvements, and that the Japanese will remain the masters of the port until they are forcibly ejected and their properties confiscated. He says that he is no longer concerned about recovering Tsingtao, but is trying to limit Japanese expansion into the interior of the Province, and that to protect the Chinese living along the line of the railway from bandits, opium smugglers and property buyers working in the interests of the Japanese, he is going to establish a chain of Chinese garrisons paralleling the line, and that he hopes to be able to place a full division along the railways without attracting Japanese attention.

ATTITUDE OF MANCHURIAN CHINESE TOWARD THE WITHDRAWAL OF EUROPEAN AND AMERICAN TROOPS FROM SIBERIA.

Source: Reliable.

(12065)

30 January 1920.

The attitude of the local Chinese against the withdrawal of the allied troops from Siberia is apparently very bitter. They contend that if the American and European contingents are withdrawn the Japanese should withdraw also. The latter instead of withdrawing any troops are sending reinforcements.

During a recent interview with Gov. Gen. Chang Tso-lin, the latter expressed himself as follows:

"The Chinese have given up all hope of either material or moral assistance from the Allies, and are especially disappointed in the attitude recently adopted by America, from whom China expected much help. At the time the Allies decided to send an expeditionary force to Siberia, the Japanese of course participated. During the occupation of China by the Japanese, the latter organized themselves into a financial, economic, strategic, and fighting force. The Japanese yen is rapidly becoming the chief circulating medium in the districts which have felt the influence of Japanese occupation. By the withdrawal of the American troops the guarding of the Siberian railways will fall into the hands of Japan, who will eventually demand that freight and passenger tariffs be collected in Japanese currency. Such a procedure would enormously enhance Japan's influence throughout Siberia as well as north Manchuria, principally, as usual, at the expense of China. The American and European Allies on their withdrawal should arrange to prevent the Chinese property from falling into the hands of Japan, which has long coveted this valuable holding. The Japanese have long wished to control the commercial port of Vladivostok and they will gain their desire by the withdrawal of the other allied troops. By increasing their already large army in Siberia, the Japanese will be able to enforce their demand for various concessions, such as mining, forestry and commercial privileges, to say nothing of gradually acquiring territory.

"The Japanese war office has authorized the dispatch of 45 regiments to Siberia in order to strengthen their present force, 15 regiments having already been sent. These troops, on arrival, will be distributed at various strategical points throughout Siberia. Gen. Semeonoff's pro-Japanese sentiments are well known; and, as he is now viceroy of Vladivostok, he is in a position to assist his friends in various ways. Many of the Chinese have formed an

opinion that some sort of secret understanding has been reached between America and Japan regarding Siberian affairs."

The fallacy of such a secret agreement or understanding was explained to the governor, as such an action would be contrary to American ideals. It was also explained that the original purpose of sending American troops to Siberia was to facilitate the withdrawal of Czecho-Slovak troops, and this once accomplished, no further reason existed for the retention of an American military force in that region. To do otherwise would needlessly endanger American lives to say nothing of involving the United States Government in an unnecessary financial expenditure.

Because of the dislike of the Russians for the Japanese, this office has to-day been informed that the Chinese Eastern Railway has ceased operation, the Russians hoping in this way to prevent the entry of further Japanese contingents into Siberia via that route. It is also said that the Russians as a unit strongly oppose the dispatch of additional troops.

It may be recalled that last year Gen. Semeonoff visited Mukden, ostensibly for the purpose of meeting his wife, who was returning from a holiday in Japan, his real purpose it being contended was to confer with the local Japanese authorities regarding Siberian affairs.

Dates for completion of vessels.

MAY 21, 1920.

BATTLESHIPS.

New Jersey [1]	Boston	Indefinite.	Rhode Island [1]	Mare Island	Not set.
Virginia [1]	do	Do.	Vermont [1]	do	Do.
Louisiana [1]	Philadelphia	Do.	New York	Puget Sound	June 26.
Georgia [1]	Mare Island	Not set.	Texas	do	Indefinite.
Nebraska [1]	do	Do.			

CRUISERS AND GUNBOATS.

Des Moines	Portsmouth	May 26.	Cleveland	Mare Island	May 30.
Huntington [1]	do	Indefinite.	Denver	do	Indefinite.
Chester (res.)	Boston	Do.	Charleston	Puget Sound	Not set.
Frederick	Philadelphia	Do.	Montana	do	Do.
Pueblo [1]	do	Not set.	North Carolina	do	Do.
St. Louis	do	Do.	Seattle	do	Do.
Wheeling	New Orleans	June 1.			

[1] To be placed out of commission

Dates for completion of vessels—Continued.

DESTROYERS.

Fairfax (red. com.)	Portsmouth	Indefinite.	Balch (red. com.)	Norfolk	Indefinite.
Gridley (red. com.)	do	Do.	Benham (red. com.)	do	Do.
Israel (res.)	do	Do.	Branch (fit. out)	do	Do.
Lansdale (res.)	do	Do.	Connor (res.)	do	Do.
McKean (red. com.)	do	June 1.	Dallas (fit. out)	do	Do.
McKee (red. com.)	do	Indefinite.	Downes (red. com.)	do	Do.
Taylor (red. com.)	do	Do.	Duncan (red. com.)	do	Do.
Ausburne (fit. out)	Boston	Do.	Graham (fit. out)	do	Do.
Converse (fit. out)	do	Ready.	Manley (res.)	do	Ready.
Conyngham (red. com.)	do	Indefinite.	Mason (fit. out)	do	Do.
Cowell (res.)	do	Do.	Parker (red. com.)	do	Indefinite.
Foote (res.)	do	Do.	Satterlee	do	Do.
Kalk	do	Do.	Bush (res.)	Charleston	Do.
Kimberly (red. com.)	do	Do.	Osmund Ingram	do	Do.
Lardner	do	Do.	Aaron Ward	Mare Island	Do.
Luce (res.)	do	Do.	Buchanan	do	Do.
Maddox (res.)	do	Do.	F. F. Burnes (fit. out)	do	May 29.
Meredith (res.)	do	Do.	Claxton	do	Indefinite.
Sharkey	do	Do.	Evans	do	Do.
Sicard (fit. out)	do	Do.	Gillis	do	Do.
Broome	New York	May 20.	Kilty	do	Do.
Caldwell	do	Indefinite.	Mugford	do	Do.
Dyer (red. com.)	do	Do.	Wickes	do	Do.
Gregory (red. com.)	do	Do.	Dent (res.)	Puget Sound	Do.
McDougall (red. com.)	do	Do.	Dorsey (res.)	do	Do.
Morris	do	Do.	Edwards (res.)	do	Do.
Sampson (red. com.)	do	Do.	Gwin (fit. out)	do	Do.
Gilmer (fit. out)	Philadelphia	Ready.	Rathburne (res.)	do	Do.
Hatfield (fit. out)	do	Do.	Talbot (res.)	do	Do.
Parrot (fit. out)	do	Do.	Waters (res.)	do	Do.
Whipple	do	Indefinite.			

SUBMARINES AND SUBMARINE TENDERS.

Eagle No. 14	Boston	Indefinite.	S–3	New York	Indefinite.
O–3	do	June 5.	Eagle No. 17	Norfolk	Do.
O–5	do	June 11.	L–3, 9, 10	do	Do.
Rainbow	do	Indefinite.	K–8	Key West	May 27.
Savannah	do	Do.	L–6	Mare Island	June 1.

FLEET TENDERS (TRAIN).

Rappahannock (res.)	Portsmouth	July 15.	Celtic	Mare Island	May 20.
Proteus	Norfolk	June 1.	Comfort (ord.)	do	Indefinite.
Brutus	Mare Island	Indefinite.			

MINE FORCE.

IN COMMISSION.

Baltimore, Mare Island, indefinite.

IN RESERVE.

Auk	Portsmouth	Indefinite.	Lapwing	Charleston	May 29.
Chewink	do	Do.	Penguin	do	Ready.
Curlew	do	Do.	Sanderling	do	Indefinite.
Flamingo	do	Do.	Tanager	do	Do.
Grebe	do	Do.	Turkey	do	Do.
Osprey	do	Do.	Whippoorwill	do	Do.
Woodcock	do	Do.	Widgeon	do	Do.
Robin	New York	Do.	Pigeon	Mare Island	Do.
Bobolink	Norfolk	June 1.			

MISCELLANEOUS.

Patapsco	Portsmouth	May 26.	Rintintin	New York	June 5.
Patuxent	do	Indefinite.	Annapolis	Philadelphia	June 1.
Algorma	New York	Do.	Hannibal (res.)	do	Indefinite.
Aramis	do	Do.	Conestoga	Norfolk	Do.
Kewaydin	do	June 1.	Jupiter	do	Do.
Nokomis	do	Indefinite.	Navajo	Pearl Harbor	Do.

Dates for completion of vessels—Continued.

N. O. T. S.

Alameda	Norfolk	Indefinite.	Nero	Charleston	July 24.
Caesar	do	Do.	Arethusa	New Orleans.	Indefinite.
Gulfport	do	June 26.	Newport News	Mare Island	June 15.
Mars	do	June 25.	Pensacola	do	Indefinite.
Beaufort	Charleston	May 26.	Bath	Puget Sound.	Do.

OTHER GOVERNMENT DEPARTMENTS.

U. S. Army.

Gen. Schofield	Portsmouth	Indefinite.	New Orleans	New Orleans.	June 5.
Donovan	New Orleans.	Do.	Taber	do	May 20.
			Great Northern	Mare Island	Indefinite.

U. S. Shipping Board.

Otsego	Portsmouth	Indefinite.	Moccasin	New York	Indefinite.
Peacock	do	Do.	Willet	Philadelphia.	Do.
Black Arrow	Boston	Do.	Comstock	New Orleans.	Do.
Geo. Washington	do	June 30.	Orion	do	Do.
Agamemnon	New York	Indefinite.	Sequoia	Mare Island	Do.
Lake Deval	do	Do.			

PANAMA CANAL COMMISSION.

Favorite, New York, May 20.

BATTLESHIPS OUT OF COMMISSION.

Coast B. S. No. 1 [2]	Philadelphia.	Coast B. S. No. 4 [2]	Philadelphia.
Coast B. S. No. 2 [2]	Do.	Missouri [2]	Do.
Illinois [2]	Do.	Maine [2]	Do.

BATTLESHIPS UNDER REDUCED COMMISSION.

At Philadelphia.

Alabama. [1]	Kearsarge. [1]	Louisiana. [1]
Kansas. [6]	Kentucky. [1]	Wisconsin. [1]

CRUISERS, GUNBOATS, AND MISCELLANEOUS OUT OF COMMISSION.

Dubuque [3]	Portsmouth.	Tallahassee	Charleston.
Paducah [3]	Do.	Topeka	Do.
Isabel	Philadelphia.	Monadnock [4]	Olongapo.
Ozark [2]	Do.	Castine [4]	New Orleans.
Tonopah [2]	Do.	Cincinnati [4]	Do.
Yankton [4]	Do.	Petrel [4]	Do.
Jupiter [5]	Norfolk.	Wheeling	Do.
Standish [4]	Do.	Bay Ocean [4]	Mare Island.
Wasp [4]	Do.	Machias [4]	Do.
Winchester [4]	Do.	Marblehead [2]	Do.
Nashville [3]	Charleston.	Supply	Do.
Raleigh [4]	Do.	Yorktown [4]	Do.

TORPEDO BOATS OUT OF COMMISSION.

CTB No. 1 (Foote) [2,4]	Philadelphia.	CTB No. 9 (Somers) [2,4]	Philadelphia.
CTB No. 2 (Rodgers) [2,4]	Do.	CTB No. 11 (Barney) [2,4]	Do.
CTB No. 3 (Dupont) [2,4]	Do.	CTB No. 12 (Biddle) [2,4]	Do.
CTB No. 4 (Dahlgren) [2,4]	Do.	CTB No. 14 (Delong) [2,4]	Do.
CTB No. 6 (Morris) [2]	Newport.	CTB No. 16 (Thornton) [2,4]	Norfolk.

[1] To be placed out of commission.
[2] No work being done.
[3] General repairs.
[4] To be sold.
[5] Conversion into aeroplane carrier.
[6] Repairs completed.

Dates for completion of vessels—Continued.

EAGLE BOATS IN ORDINARY.

AT PORTSMOUTH.

Eagle No. 2.	Eagle No. 26.	Eagle No. 39.	Eagle No. 51.
Eagle No. 3.	Eagle No. 27.	Eagle No. 41.	Eagle No. 52.
Eagle No. 7.[6]	Eagle No. 28.	Eagle No. 42.	Eagle No. 54.[6]
Eagle No. 9.	Eagle No. 29.	Eagle No. 44.	Eagle No. 55.
Eagle No. 13.	Eagle No. 34.	Eagle No. 45.	Eagle No. 56.[6]
Eagle No. 18.	Eagle No. 35.	Eagle No. 46.[6]	Eagle No. 59.
Eagle No. 19.	Eagle No. 36.	Eagle No. 47.	
Eagle No. 23.[6]	Eagle No. 37.	Eagle No. 48.	
Eagle No. 24.	Eagle No. 38.	Eagle No. 50.	

SUBMARINES OUT OF COMMISSION.

U-117 [7]	Philadelphia.	UB-88 [7]	San Pedro.
U-140 [7]	Do.	U-111 [7]	Portsmouth.
UB-148 [7]	Do.	A-2, 4, 6, 7 [4]	Cavite.
G-1 [8]	Do.	B-2 [4]	Do.
UC-97 [7]	Chicago.		

SUBMARINES AND SUBMARINE TENDERS IN RESERVE.

D-1, 2, 3 [9]	New London.	F-2, 3 [9]	San Pedro.
E-1, 2 [9]	Norfolk.	Rainbow	Boston.
G-3 [9]	New London.		

SUBMARINES IN ORDINARY.

A-3, 5 [2]	Cavite, P. I.	B-3 [2]	Cavite, P. I.

VESSELS TO BE PLACED OUT OF COMMISSION IN NEAR FUTURE.

Warbler	Philadelphia.	Quiros [4]	Asiatic station.
Elcano [4]	Asiatic station.	Samar [4]	Do.
Pampanga [4]	Do.	Villalobos [4]	Do.

REDUCED COMMISSION OR ORDINARY.

Rappahannock [3]	Portsmouth.	Hannibal [3]	Philadelphia.
Chester [3]	Boston.	Comfort [3]	Mare Island.
Caesar [3]	Norfolk.		

DESTROYERS OUT OF COMMISSION.

AT PHILADELPHIA.

Ammen.	Jarvis.	Patterson.	Trippe.
Beale.	Jenkins.	Paulding.	Walke.
Burrows.	Jouett.	Perkins.	Warrington.
Drayton.	Mayrant.	Roe.	
Fanning.	McCall.	Sterrett.	
Henley.	Monaghan.	Terry.	

OLD DESTROYERS OUT OF COMMISSION AND BEING SOLD.

AT PHILADELPHIA.

Hopkins. Smith.

[2] No work being done.
[4] To be sold.
[6] In full commission.
[7] Being dismantled.
[8] Target for depth-charge experiments.
[9] Elemental S/M school work.
[3] General repairs.

Summary by navy yards of ships under repair.

	PORTSMOUTH, N. H.	
1	Des Moines	May 26.
	Huntington	Indefinite.
5	Fairfax (Red. Com.)	Do.
5	Gridley (Red. Com.)	Do.
	Israel (Res.)	Do.
5	Lansdale (Res.)	Do.
3	McKean (Red. Com.)	June 1.
	McKee (Red. Com.)	Indefinite.
	Taylor (Red. Com.)	Do.
6	Rappahannock (Res.)	July 15.
	Auk (Res.)	Indefinite.
	Chewink (Res.)	Do.
	Curlew (Res.)	Do.
	Flamingo (Res.)	Do.
	Grebe (Res.)	Do.
	Osprey (Res.)	Do.
	Woodcock (Res.)	Do.
2	Patapsco	May 26.
4	Patuxent	Indefinite.
	General Schofield	Do.
	Otsego	Do.
	Peacock	Do.
	BOSTON.	
	New Jersey	Indefinite.
	Virginia	Do.
	Chester (Res.)	Do.
	Ausburne (Fit. out)	Do.
	Converse (Fit. out)	Ready.
	Conyngham (Red. Com.)	Indefinite.
	Cowell (Res.)	Do.
	Foote (Res.)	Do.
	Kalk	Do.
	Kimberly (Red. Com.)	Do.
	Lardner	Do.
	Luce (Res.)	Do.
	Maddox (Res.)	Do.
	Meredith	Do.
3	Sharkey	Do.
	Sicard (Fit. out)	Do.
	Eagle No. 14	Do.
1	O-3	June 5.
	O-5	June 11.
2	Rainbow	Indefinite.
5	Savannah	Do.
	Black Arrow	Do.
	George Washington	June 30.
4	Bridgeport [1]	
6	Destroyers fitting out	
	NEW YORK.	
	Broome	May 20.
	Caldwell	Indefinite.
	Dyer (Red. Com.)	Do.
7	Gregory (Red. Com.)	Do.
	McDougal (Red. Com.)	Do.
	Sampson (Red. Com.)	Do.
4	Morris	Do.
	S-3	Do.
6	Robin (Res.)	Do.
	Algorma	Do.
	Aramis	Do.
2	Kewaydin	June 1.
	Nokomis	Indefinite.
3	Rintintin	June 5.
	Agamemnon	Indefinite.
	Lake Deval	Do.
	Moccasin	Do.
	Favorite	May 20.
1	Newport	Indefinite.
5	Sagamore	Do.

	PHILADELPHIA.	
7	Louisiana	Indefinite.
4	Frederick	Do.
	Pueblo	Not set.
5	St. Louis	Do.
	Gilmer (Fit. out)	Ready.
	Hatfield (Fit. out)	Do.
	Parrot (Fit. out)	Do.
	Whipple	Indefinite.
1	Annapolis	June 1.
6	Hannibal (Res.)	Indefinite.
	Willet	Do.
2	Destroyers fitting out	
3	Iowa	Indefinite.
	NORFOLK.	
	Balch (Red. Com.)	Indefinite.
	Benham (Red. Com.)	Do.
	Branch (Fit. out)	Do.
	Connor (Res.)	Do.
	Dallas (Fit. out)	Do.
	Downes (Red. Com.)	Do.
	Duncan (Red. Com.)	Do.
	Graham (Fit. out)	Do.
	Manley (Res.)	Ready.
	Mason (Fit. out)	Do.
	Parker (Red. Com.)	Indefinite.
5	Satterlee	Do.
	Eagle No. 17	Do.
	L-3, 9, 10	Do.
1	Proteus	June 1.
2	Bobolink	Do.
7	Conestoga	Indefinite.
4	Jupiter	Do.
3	Alameda	Do.
	Caesar	Do.
4	Gulfport	June 26.
6	Mars	June 25.
8	Destroyers fitting out	
9	Other destroyers, submarines	
	CHARLESTON.	
	Bush (Res.)	Indefinite.
	Osmund Ingram	Do.
	Lapwing (Res.)	May 29.
	Penguin (Res.)	Ready.
	Sanderling (Res.)	Indefinite.
	Tanager (Res.)	Do.
	Turkey (Res.)	Do.
	Whippoorwill (Res.)	Do.
	Widgeon (Res.)	Do.
1	Beaufort	May 26.
2	Nero	July 24
4	Ninette	
3	Mine sweepers, Pacific Fleet	
5	Destroyers	
	KEY WEST.	
	K-8	May 27.
	NEW ORLEANS.	
2	Wheeling	June 1.
1	Arethusa	Indefinite.
	Donovan	Do.
	New Orleans	June 5.
	Taber	May 20.
	Comstock	Indefinite.
	Orion	Do.
3	Allegheny	Do.

[1] To be sent to this yard for work.

Summary by navy yards of ships under repair—Continued.

	MARE ISLAND.	
	Georgia	Not set.
	Nebraska	Do.
	Rhode Island	Do.
	Vermont	Do.
3	Cleveland	May 30
12	Denver	Indefinite.
10	Aaron Ward	Do.
	Buchanan	Do.
10	Evans	Do
	J. F. Burnes (Fit. out)	May 29.
7	Claxton	Indefinite.
8	Gillis (Res.)	Do.
6	Kilty	Do.
9	Mugford	Do.
10	Wickes	Do.
11	L–6	June 1.
4	Brutus	Indefinite.
2	Celtic	May 20.
	Comfort (Ord.)	Indefinite.
11	Baltimore	Do.
	Pigeon (Res.)	Do.
5	Newport News	June 15.
1	Pensacola	Indefinite.
	Great Northern	Do.
	Sequoia	Do.

	PUGET SOUND.	
1	New York	June 26.
3	Texas	Indefinite.
	Charleston	Not set.
	Montana	Do.
	North Carolina	Do.
	Seattle	Do.
	Dent (Res.)	Indefinite.
	Dorsey (Res.)	Do.
	Edwards (Res.)	Do.
	Gwin (Fit. out)	Do.
	Rathburne (Res.)	Do.
	Talbot (Res.)	Do.
	Waters (Res.)	Do.
2	Bath	Do.
4	Destroyer Division 14	
	PEARL HARBOR.	
	Navajo	Indefinite.

NOTE.—The number placed before the names of vessels indicates the order of priority.

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NUMBER 7—1920—15 JULY 1920.

FOR CONVENIENCE IN ROUTING.

Officer.	Initials.	Date received.	Date forwarded.
Captain			
Executive Officer			
First Lieutenant			
Navigating Officer			
Gunnery Officer			
Communication Officer			
Engineer Officer			
Medical Officer			
Supply Officer			
First Division Officer			
Second Division Officer			
Third Division Officer			
Fourth Division Officer			
Fifth Division Officer			
Marine Officer			

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MISCELLANEOUS.

"THE TWO WHITE NATIONS."

The Following is a Translation of the Preface Appearing in "The Two White Nations."

The translation of this preface should precede the translation of the first part of "The Two White Nations" appearing in the June issue of the Monthly Information Bulletin.

Severe hardship is in store for the German nation. Our youth will grow up in a subjugated Germany in which foreign officials will compel them to do statute labor for them. We shall be made to feel the contempt with which the Anglo-Saxon regards us. Even the French and Italians, and other nations, who are mentally, physically, and morally inferior to us, will regard us as crude and justly punished barbarians.

I am firmly convinced that our German youth will not be disconcerted thereby. Strong-hearted Germans, young and old, must and will devote their efforts to prevent our people from allowing their national characteristics to perish in a weak, un-German, bondsman's view of life and the world. It is the duty of we older men to aid the German youth in this struggle both by precept and example. We must keep alive the memory of all that has made the German people strong and proud; the deeds and times in which the German people have proved themselves to be of true nobility.

Two walks of life have been familiar to me during the 22 years in which I have been permitted to serve the Fatherland as a naval officer, that of the German officer and that of the sailor. When to-day I look back upon the past, revolution and defeat having almost utterly wiped out these two phases of our culture, I do so with a feeling of gratitude toward the profession, in which I lived and worked with German men and youths who were true Germans at heart and who in war and in peace devoted their efforts and their lives to the greatness of Germany. And I am thankful to my profession for bringing me into association with almost all the nations of the earth under conditions which always gave me reason to be proud that I was a German and a sailor.

I hope that what I shall now relate concerning the period of my former calling may contribute toward filling the German youth with the same enthusiasm for the Fatherland as filled the men of Germany before they were forced to draw their swords against a world of

enemies; and with the same pride with which we fought and advanced from victory to victory for four long years, and with the feeling of a nation in no respect inferior to any other, until we finally succumbed when our weapons were struck from our hands at a most critical moment by men of our own nation who in their nature were not true Germans.

My little book will treat of two historical meetings between the Germans and the English.

The first meeting occurred shortly before the outbreak of the war and it was highly characteristic of the relation in which we Germans at that time stood toward our present deadly foes, the English. It was in June, 1914, when a large English squadron visited Kiel. I was detailed as personnel aide to Vice Admiral Sir George Warrender, who was then commander in chief of the fleet, for the duration of the stay of the squadron at Kiel. During this time, in which the murder of Serajevo occurred, I, together with the English ambassador, Sir Edward Goschen, and other guests of the admiral, lived on board his flagship, the *King George V*. Early in July, 1914, immediately after the departure of the English squadron, I wrote down my experiences and the impressions received during this period on board the *King George V*, from notes kept in the form of a diary.

The second historical meeting of which I shall speak was the battle of the Skagerrak. In this battle I had the good fortune, as chief gunnery officer of our largest, fastest, and most powerful ship, the battle cruiser *Derflinger*, to participate in the hottest part of the battle, as well as in all the other phases of the conflict and to play a decisive rôle in the destruction of the two English battle cruisers, the *Queen Mary* and the *Invincible*. As no report of the battle has thus far been published in which a participant describes and passes judgment upon the engagement in a wholly impartial spirit and not handicapped by the censor, I have endeavored, while describing my own experience, to portray what happened solely from an historical and absolutely unprejudiced point of view, and to depict the battle, so far as I was able to observe it, as it actually took place.

Before I describe these two meetings, which have now become historical, I should like to cite briefly here a typical example of how, before the war, in spite of all envy and rivalry, no true Englishman thought of regarding a true German as other than a representative of an equal and related nation.

This was in the year 1913.

Off the coasts of Albania ships of almost every nation were lying at anchor. The commander of the German cruiser *Breslau* had invited the admirals and commanding officers of all nationalities to dinner. Next the German commander sat the English admiral, and all around, between Germans and Englishmen, sat Italians, French,

Russians, Spaniards, Turks, Greeks, and Albanians, in a motley assemblage. Toasts had been proposed and the political situations were being animatedly discussed in all possible languages. The English admiral and the German commander had seen each other furtively examining the members of this strange round table, and they exchanged their observations regarding the highly diversified types of people.

Suddenly the English admiral raised his glass, gazed straight into the blue eyes of the German commander, and as their glasses touched, softly whispered: "The Two White Nations." With flashing eyes the two men regarded each other the representatives of the two greatest seafaring Germanic nations. They felt that they were of one stock, originally members of one and the same noble people.

Thus, and not otherwise, did every true German and every true Englishman feel before the war.

And now? Now, the English people and their imitators dare to call us "Huns." The other of "The Two White Nations" gives to our noble nation which has fought for right and freedom, for hearth and home, as no other people in the world have ever fought before, the name of a Mongolian tribe of the lowest civilization.

German men! German youths! do not permit yourselves to be disturbed by stupid arrogance of this sort. Prove daily to our enemies by your actions that our civilization is not inferior to that of any other nation in the world; and see to it that the world recognizes the truth, that we have fought the war in a no less knightly fashion than our opponents, who forced us to harsh retaliatory measures solely by their own cruel methods.

CHAPTER IV.

(Continued.)

The Historical Value of Personal Narratives of Naval Battles.

The translation of the first part of "The Two White Nations" appears in the June issue of the Monthly Information Bulletin.

Anyone wishing to narrate his war experiences may do so in two ways: First, the narrator may enlarge upon his own experiences, which in many instances would be of little interest to his hearers or readers, by material derived from other sources, thus producing not so much an accurate account of the events in which he participated but a more or less vivid picture of the entire conduct of the war. Second, one may simply narrate his own experiences, however undramatic and important they may be in comparison with the war as a whole, thus making oneself responsible for the historical accuracy of his narrative even to the smallest detail. In describing the battle of the Skagerrak, it will be my endeavor to follow this latter method.

The day of Lowestoft had plainly demonstrated to me that it is almost impossible even immediately after a battle to write down in chronological order the events of the battle from the verbal reports of the participants. It was the custom in the Navy to keep no records during the engagement, this to insure that each man would be absorbed only in the duties of his particular station. This fact made it impossible for me even after the battle of Lowestoft to determine satisfactorily at what ranges and in exactly what directions we had fired when we were bombarding cities and later when the British cruisers and torpedo destroyers were under our fire. In the official account of the battle, the statements as to whether the enemy torpedo boats fled toward the west or toward the east differed materially. I therefore took steps to make certain that in any future battle all gunnery commands and occurrences and my own observations would be carefully recorded. I directed an old reliable petty officer in the central station of the main battery to write down each order as given by me. As his telephone headpiece was connected with mine, he was able to hear every order that I gave. This phone also enabled me to maintain communication with the observation officer in the foretop and with the officer at the range telephone clock in the central station. In addition to writing down my orders, he also recorded the range for each salvo of the main battery and in what direction the guns were trained for each salvo. The train was reported in degrees, beginning with zero degrees for dead ahead. The guns were therefore at 90° when trained on the starboard beam, 180° when trained astern, and 270° when trained on the port beam. In the central station was an electric fire-control device from which one could read at any instant the positions of each turret in azimuth. In addition to the above, an accurate record to within 10 seconds was kept of the time at which each order was given and each shot fired.

The courses and speeds of a ship during a naval battle are recorded by a quartermaster stationed in the central station, who obtains his readings from the compass and speed indicator. With this data as plotted on the navigator's chart, it would be easy to plot the enemy position at any phase of the battle, knowing one's own course and speed and the direction of fire and range of one's own guns. After the battle of Lowestoft, I developed in detail this system of keeping records of both battle target practice and clear ship for action exercises. In addition to the above, I also had recorded at other important battle stations, such as the gun turrets and centrals of the secondary battery, all orders and announcements which were received at or transmitted from these stations. I also had a record kept of all important events occurring at their stations by the following, viz, the second gunnery officer and the fourth gunnery officer, who were stationed in the after conning tower. I

emphasized constantly in our drills that it was of the greatest importance to keep these records during the battle. Hence in the battle of the Skagerrak, a good record was kept at all the stations mentioned above, thus enabling me to give an accurate account of almost every shot fired by the ship's batteries. By knowing the direction and range of those salvos which we knew hit the target or fell in the immediate vicinity of the enemy, it was not difficult to draw a mathematically correct diagram of the battle. These diagrams, which are still in my possession, together with my diary and letters written to my people, form the basis of my report on this battle. Unfortunately the records made in the 30.5 centimeter turrets, *Cæsar* and *Dora*, were completely destroyed when those turrets were demolished.

The Spectator of 9 June, 1916, published an article on the value of official and personal narratives of naval battles and in particular the battle of the Skagerrak. The author, Bennet Copplestone, gave an excellent opinion concerning the value of all such narratives in which, as can not happen otherwise in war, the censor and military interests have a controlling effect. The author of the article, in my opinion, had at that time taken great pains to ascertain the true story of the battle from both the English and the German reports. Naturally he could not altogether refrain from viewing the matter from an English standpoint, and, in some instances, he furnished us with absolutely new details, especially concerning the tactics of the leader of the English battle cruisers, Admiral Beatty, who by utilizing his ships, which far surpassed ours in speed, executed a very typical encircling maneuver. There follows a translation of the article from English into German, the publication of which in German papers was not permitted by the German censors in the year of 1916:

* * * * * * *

This article in the Spectator gives a very clear idea of the difficulties met in accurately describing a naval battle after its occurrence. In order to be able to describe the battle of the Skagerrak with perfect accuracy, it would be necessary for the historian to have at his disposal all the official and personal records of both sides. But the English will find very little interest in transmitting to posterity the exact details of this for them inglorious battle. And shall we, after the collapse of our Navy and with a pacifist government at our head, undertake it? I trust so. Meanwhile, we who took part in that battle must do our utmost to insure that this duel between "The Two White Nations," maritime nation against maritime nation, shall be handed down to our descendants as it actually occurred.

CHAPTER V.

On Board the "Derfflinger" on its Way Out to the Skagerrak.

On 31 May, 1916, the battle cruisers weighed anchor at 3 o'clock in the morning. They were the *Lutzow* (the flagship of Vice Admiral Hipper, commanding the scouting ships), *Derfflinger*, *Seydlitz*, *Moltke*, and *Von Der Tann*. We had passed the night anchored in Schillig Roadstead off the entrance of Jade Bay. Ahead of us were the small cruisers and several torpedo-boat flotillas. It was a beautiful clear night, which was soon followed by a glorious morning. The sun in all its majesty appeared over the horizon and flooded the sea with its golden beams, and soon there was visible to us that unforgotten picture for which we had so often longed—the entire high seas fleet steaming toward the enemy. Some distance ahead of us were the small cruisers in column surrounded by a screen of torpedo boats that constantly circled around the cruisers in search of hostile submarines, like shepherd dogs caring for their flocks. Next came the battle cruisers, five powerful ships with defiant names, the pride of the fleet. The *Lutzow* and *Derfflinger*, sister ships, were both completed during the war. The *Lutzow* joined the fleet just two months before the battle. One of the first cruises of the *Lutzow* was the raid against Lowestoft. The *Derfflinger* and the three other battle cruisers were together in the battles of Scarborough, Doggerbank (24 January, 1915), and Lowestoft. All of the battle cruisers were manned with picked officers and veteran crews and at that time untainted by sinister influences. On the 31st of May we numbered on board the *Derfflinger* 1,398 men; not one was absent on leave, but there were a few on the sick list. Those to whom leave had been granted were to have departed on the previous day, but upon receipt of the order to be in absolute readiness their leave was held up. The fact that none of our men were absent on leave was a great advantage to us as it insured absolute coordination in the battle.

The *Derfflinger* was commanded by Capt. Hartog, with Lieut. Commander Max Fischer as executive officer and Lieut. Commander von Jork as navigator. The gunnery officers under my command were Lieut. Lamprecht, second gunnery officer; Lieut. Hauser, third gunnery officer; and Lieut. von Mellenthin, fourth gunnery officer. The turret officers were Lieut. Freiherr von Speth-Schülzburg and Lieuts. (Junior Grade) Hankow and von Boltenstern. The observation officers were Lieut. von Stosch and Lieut. (Junior Grade) of Reserve Schulz. The order transmitting officer was Ensign Hoch and the range officer Ensign Friedrich. The torpedo officers were Lieut. Kossak and Ensigns Schilling and von der Decken; adjutant and signal officer, Ensign Peters; wireless officer, Ensign Thaer; ship's surgeon, Dr. Freyer. The chief engineer was Staff Engineer Kohn.

All the officers, with the exception of Lieut. von Mellenthin, who had been detached for a course of study, were present on board.

The battle cruisers also were surrounded by a screen of torpedo destroyers that cruised about us like a swarm of bees. In our numerous sweeps through the North Sea and the Baltic many a torpedo had been fired at us from the English submarines, but up to this time only the *Moltke* had been hit. The *Seydlitz* ran into a mine in the raid on Lowestoft and was forced to return after the admiral had shifted his flag to the *Lutzow*. It was necessary that we should exercise all precautions, so that all five of us should reach our rendezvous on the Norwegian coast.

Astern of us on the clear horizon we made out our main body of battleships; 22 battleships stood in line, a proud armada. At the head was the third squadron comprising our most modern ships, with the flagship *Konig* leading; then came the fleet flagship *Friedrich der Grosse*, with the commander in chief, Admiral Scheer; then came the first squadron containing ships of the Helgoland and Nassau class and bringing up the rear, the second squadron containing the obsolete battleships of the Deutschland class, among which was my old ship, *Hessen*, on board which during my five years' tour of duty as gunnery officer I had conducted so many target practices.

The battleships were surrounded by a large number of small cruisers that acted as a screen. There were also the usual number of submarines and mine sweepers surrounding the battleships. West of Helgoland and Amrum Bank the course was changed to north. Half of the gun crews were at their stations, the other half were sleeping in their hammocks near their guns or near their battle stations, in the ammunition rooms, gun-control stations, etc. I remained on the bridge during the night. I had no particular duties while cruising. The second and third gunnery officers took turns as senior watch. My commanding officer followed the principle that the executive officer, the first gunnery officer, and the first torpedo officer should have as much sleep and rest as possible while cruising, that their nerves might be in good condition when the ship went into action, an excellent regulation, which was carried out by us not only in theory but also in practice. In my case a cruise of this sort was a genuine pleasure trip. If we had news of the enemy, there was something out of the ordinary to see. If the weather was specially fine, I remained on the bridge; otherwise I slept, read, or played chess in the mess. About once every two hours I made an inspection of all the guns, questioning the officers on watch and the gun captains to make sure that everything was ready. I was usually accompanied by the Heinzelmännchen in my rounds through the ship, and as a matter of fact we always found something that needed immediate attention. The Heinzelmännchen then summoned his gang,

comprising electricians, artificers, and voice-tube men, and within a very short time I would receive the report: "Port range telegraph on the third 15-centimeter gun is ready"; "Left ammunition hoist of *Cæsar* turret repaired," etc.

Naturally I was always on the bridge when we entered a region in which submarines or mines had just been reported and on dark nights when torpedo boats were to be expected. But I could arrange this as I wished and such occasions were usually most agreeable ones to me.

I had a large room on the top deck. This room was divided into two parts not directly next to ship's side but set somewhat inboard. Except in stormy weather, I was able to have my side ports open and thus gain a good view of the sea from my cabin and immediately became aware if anything unusual was going on.

It thus happened that on 31 May after enjoying the sunrise—which to me on the high seas had always a fresh charm but which seen while lying at anchor in the brown waters of the Jade could not induce me to leave my bed. I turned over for a couple of hours' more sleep, then rose, shaved, made my toilet preliminary to breakfast in the mess. Most of the officers were compelled to go without the luxury of a careful toilet at sea as they were unable to use their cabins on the lower decks, as all the approaches were securely closed owing to the danger from mines.

After I had breakfasted, I sat down in my comfortable room, did a little writing, and enjoyed a view over the sea. Before noon I had made another tour of inspection of the battery and at dinner there arose the usual topic of conversation "I wonder if we shall see anything of the enemy." The extent of our cruise was farther out than had been the case previously and torpedo boats were to make a search in the Skagerrak waters on the night of 31 May for hostile and neutral merchant ships. It was therefore assured that on this night our presence in the Skagerrak would be announced, that the English fleet would start out from England soon after receipt of this information and that we must count upon a meeting with the Eng ish main body on 1 June. Moreover groups of English armored cruisers and light cruisers had been reported off the Norwegian coast and it was probable that we would come up with these during the night of 31 May, or perhaps during the afternoon of that day. No one in the German fleet, not even the commander in chief, dreamed that the entire English Grand Fleet was at sea and steaming toward the same point that we were. Similarly in the English fleet, according to all reports, no one knew that the German fleet was at sea. There was no reason in the world to doubt the truth of this and yet ashore it was repeatedly asked "How did the English know that we were standing off the Skagerrak?" or "How did we know that the English were going to enter the Baltic?"

All this is idle talk. The battle of the Skagerrak was as reported by both admiralties, the result of a chance meeting of the two fleets while engaged in their frequent cruises into the North Sea. If one considers that the North Sea is larger than the whole of Germany and how easy it would be for two fleets to cruise in so vast a region without meeting, the remarkable chance which brought our advance scouts and the advance scouts of the English together was truly remarkable. The battle of the Skagerrak in its first phases developed exactly like a carefully prepared methodical battle in which first the small cruisers, then the battle cruisers and finally the main body made contact.

At our noonday meal from which half of the officers were absent on watch duty, an excited enthusiastic spirit prevailed. Almost everyone believed that this time we would use our guns, but no one talked of anything but the light forces or a squadron of the older armored cruisers. No one considered the possibility that the entire British fleet was standing toward us only a few hours away. A few were pessimistic and thought that we would soon be turning back without having accomplished anything. The chief surgeon while at sea always carried a large pocket compass with him which lay on the table beside him. As the armor porthole covers of the officers' mess were closed and we therefore had no view of the sea and we were unable to tell when a course was altered, we called him our lower deck strategist. We kept constant check on his compass while at table. On the whole there was a feeling in the mess that we were on the eve of some unusual experience. As was the rule when we were making one of our excursions into the North Sea, no one at the table drank a drop of alcohol. Nevertheless, not one of us was a scorner of wine, woman, and song. But on every excursion we were as strict with ourselves as a sportsman is during a contest. From the moment of weighing anchor until we returned in the home roadstead, we were almost total abstainers.

We smoked our cigars and then the younger officers went on watch while those released from duty appeared at the table. I went to my room, stretched myself out on my bunk and watched the blue rings of my cigar and dreamed of battle and victory. If only we could fight it out with our guns this time. My whole professional career seemed to me so meaningless and so empty unless I could at least once know what it was to be engaged in battle on the high seas. Blow for blow, that is the way it would go. I knew from 12 hours of gunnery practice that I had learned to fire. That was sport that I could understand. If I just had the target in my periscope and the first crashing salvo had left the gun, nothing could then disturb my peace. Nevertheless I did not as yet know how I should feel in the thick hail of enemy shells, but that did not bother me; I would soon find out.

At 2 o'clock the drums sounded a long roll throughout the ship, the signal to "clean guns." Every one except the officers must immediately take their battle station. This is the most important hour of the day for the gunnery officer. During the cleaning of the guns, the entire mechanism is tried out, cleaned, and oiled and all the apparatus is checked to make certain that all adjustments are correct. I would go from gun to gun accompanied by the Heinzelmännchen. In the Bertha turret a belt of the ammunition hoist had slipped off the drum. Upon placing it back in position, I found that one part of the cable was badly damaged. I decided that it should be replaced by a new cable. This would take about an hour. For a whole hour then we would be unable to do anything if we should engage the enemy. I checked up to make certain that the gun crew was provided with everything they should have during the battle. On the 29th of May after long waiting, the fleet had received about a thousand gas masks from the Army. By order of the commander in chief, these masks were to be issued to the battle cruisers and the latest battleships. On the 30th of May they were hastily distributed and tried out in a short battle practice. It was necessary to make certain that each man had his gas mask within easy reach of his battle station. The ready ammunition lay in the gun turrets alongside the guns in amounts prescribed by regulations. The guns of the main battery were loaded and ready to fire a salvo at any submarine appearing on the surface.

The executive officer who regulated the details of duty on board had turned over to me the gun crews for the period between 3 and 4 o'clock, and had given orders that this time was to be utilized in gun drills and fire-control exercises, much to the disgust of my officers and men. But I knew only too well how great was my responsibility. I knew that I could count only upon a proper operation of the entire battery when each device and each piece of mechanism was working as if in actual battle. The third gunnery officer who had charge of the secondary battery occupied the forward gunnery station for fire-control practice. Something attracted our attention. We buckled on our head telephone and then we heard "Normal switch stations for battle on the port side." In the subcentral station about 40 levers were moved over to the position ordered. The order "Switch for battle on port side" penetrated to all stations in the ship. I had my periscope directed on one of our small cruisers and gave the order "Man the range indicator." All the other gun periscopes and all the guns brought their electric indicator in line and were therefore accurately aimed at the position of the target at which I myself had my periscope aimed. I called "Question E–U?" That means in German that the first gunnery officer wishes immediately to be informed by the gunnery observa-

tion officer what change he estimates should be made in the range per minute according to his range indicator. It is the duty of the range finder officer to announce the difference in range per minute from the measured range. "Report from fore top; new range indicator lacking from fore top!" "Great heavens! The indicator will have to be brought from the gunnery office. Gunner's Mate ——— will report to me after this drill. The fore top must work for the present with the old range indicator!"

I should like to say here a few things about the range indicator. The latest type was perfected by Lieut. Commander Paschen, first gunnery officer of the *Lutzow*. It is used to ascertain simultaneously the difference in range per minute and to determine the proper setting for the deflection scale. I will not weary the reader with a description of how the setting for the deflection scale was ascertained. It will suffice for the reader to know that a correction is applied to the sights in order to neutralize all the influences tending to divert the projectile from its path by means of a slide adjustment called the deflection scale. The influences which tend to deflect the projectile from its original path are wind, speed of ship, and rifling of the gun. There is still another correction which must be made for the speed of the enemy. The excellent device designed by Lieut. Commander Paschen enables one to ascertain without calculation the proper deflection scale setting after the indicator has been adjusted for the estimated course and speed of the enemy. The principal object of the range difference indicator was to ascertain the difference in range per minute. First the apparatus is set for one's own speed which is communicated to the forward gunnery station from the conning tower for each change in speed. The speed and course of the enemy is then estimated and the indicator is then set for that. The difference in range can then be read on the indicator without any calculation. We had devices of this kind in all parts of the ship but mostly of an older type, and which did not permit reading off the deflection scale setting. If the forward gunnery station was disabled, the gunnery officer could have the difference in range computed at other stations of the ship, the operator at the range difference indicator himself being unable to see the enemy.

This, of course, would make it necessary for the gunnery officer to keep the range difference indicator operator constantly informed during battle of changes in course and speed which are very important in fire control. The gunnery officer himself also had an apparatus of this kind at hand and checked off by its means during battle the announcements of the observation officer or himself computed the difference in range in case the communication with the observation officer was interrupted.

The fire control exercises continued. "150 hundred! Salvo—fire!" This command was transmitted from the central station by means of telephone and gong to the 30.5 centimeter turrets. At the instant of the order "Fire!"—meaning the order and not the report of the discharge—the spotters stationed in the foretop of the order transmitter station, central and subcentral stations, pulled back the lever of the impact indicator. Expectant silence. At the end of the period of flight corresponding to the range, a loud-toned gong should sound at each impact indicator. The tone of this gong can be compared only with the dull sound made by a flock of sheep. I should hear simultaneously in my head telephone the impact announcers with the main battery in the foretop, the forward gunnery station, and the main central, but I heard only one gong, that in the foretop. I asked, "Why have the impact indicators not been manned." Reply: "Impact indicators have been manned but do not function." More work for the Heinzelmännchen. I give the order, "Put new batteries in all impact indicators at once!" And so we go on until finally I am convinced that all defects have been eliminated and that the battery is actually ready for battle. With this comfortable feeling I went into the mess to enjoy a cup of good coffee while sitting on the leather sofa.

I was not permitted to enjoy this pleasure very long, for at 4.28 p. m. the general alarm sounded throughout the ship, the two drums played the general march, and the watch piped "Clear ship for action!"

CHAPTER VI.

First Phase of the Battle of the Skagerrak (5.48 p. m. to 6.55 p. m.)—Engagement with the Queen Mary—Torpedo Attack and its Defense.

When I reached the conning tower, I learned that it had been announced that the *Frankfurt* had sighted individual ships to the westward. The battle cruisers were already proceeding in column at maximum speed for the designated rendezvous. We saw ahead of us the small cruisers with their torpedo boats following rapidly, at the same time making a great deal of smoke. We could no longer see our own main body. Our torpedo boats could scarcely keep up with us as they lost much headway owing to the heavy swell. Otherwise, the sea was quite smooth and only a light northwest wind (force 3) was blowing. I climbed into the forward gun station. I say "climbed" because it required some climbing to reach the point where the gun periscopes were situated after one had passed the armored door on the top landing. Reports were already arriving: "The secondary battery ready; Order transmission ready;

Foretop after gun station, main top ready," etc. When all the battle stations had reported, I reported to the commanding officer, "Guns ready."

We officers put on our telephone headpieces and the dance was ready to begin. I will ask the reader to glance at the diagram on the opposite page. The first time record in the diagram is 4.28 p. m. Up to that time the battle cruisers had been steering north. At 4.28 p. m. they altered course to the westward, which was held until 5.22 p. m. They then changed course to the north until 5.33 p. m.; then to south until 6.53 p. m.; then to the north again until 7.55 p. m.; then frequently changing course until 9.22 p. m.; then a westward course until 9.45 p. m., and then chiefly a southerly course until the end of the day's battle.

By the aid of this sketch it will be possible for the reader to follow my description of the difference phases of the battle and the course of the *Derfflinger*. The course of the *Derfflinger* was the same as that followed by the other battle cruisers as well as the enemy ships which came under the fire of the *Derfflinger*.

In the course shown as followed by the *Derfflinger* is indicated in red dotted lines the direction and range (in hectometers) of the salvos which were recorded as hits or at any rate as having covered the enemy. In these salvos the range therefore corresponds to the actual distance. The range at that moment shows the position of the enemy at the moment the salvo struck. The course of the enemy at whom we were firing against is indicated by a red line. This course is mathematically correct so far as it could be determined by the hits of our salvos. The other distances shown can not make the same claim to mathematical accuracy but deviate only slightly from the course actually steered by the English ships. At first, therefore, we ran for about a half hour almost due west and then for a half hour to the northwest.

All our periscopes and telescopes were trained on the enemy, but the heavy smoke of our cruisers obstructed our view. About 5 o'clock we heard the first shot and so learned that the *Elbing* had been hit and that the fire was being vigorously returned. My recorder in the central station recorded as the first item of information that I had given to the guns: "5.05 p. m., Our small cruisers report four enemy small cruisers not yet visible from the *Derfflinger*!" Later followed the orders: "5.30 p. m., Our small cruisers have opened fire! Train on the second small cruiser from the right! Load with armor-piercing shell and stand by! Point of aim right edge water line! 180 hundred! Distribute fire from the right! Deflection scale left 20! 170 hundred!"

It was already beginning to get hot in the gun station. I removed my coat and had it placed in the charthouse behind the gun station. I never saw it again. Up to this time not one of us had believed that we were attacking an enemy of equal power. This led me to say to the commander in the gun station, "Enemy battle cruisers have been reported." I also gave this information to the gun crews. It now became clear that in a very short time a life-and-death struggle would take place. For an instant it became noticeably more quiet in the gun station, but this lasted for only a few moments; then the din became again. Now everything moved along in faultless order and calm. I had the guns trained where I supposed the enemy must be. I had set my periscope for the maximum magnification of 15 times, which was the prescribed adjustment for clear, bright weather. But still I could see nothing of the enemy. Now, however, a change took place ahead of us. The small cruisers and torpedo boats had countermarched and were seeking cover behind the battle cruisers. We were now at the head of the line. The horizon was free of smoke, and we could now make out some small English cruisers, which had also countermarched. Suddenly I saw large ships in my periscope—six large ships steaming in two columns. They were still a long distance off, but stood out clearly on the horizon, and even at this distance they appeared powerful and menacing. We continued on our northerly course but a short time longer, and at 5.33 p. m. our flagship, *Lutzow*, behind which we were following as second ship in the line, turned to the south. The enemy likewise turned to the south on a converging course, and thus the two lines approached ever nearer as both squadrons steamed to the south at a maximum speed. The intention of Admiral Hipper was clear. He wished to lead the enemy battle cruisers toward our main body.

The recorder at this moment recorded my command: "5.35 p. m. Ship turns to southward. Prepare for battle on the starboard hand. 170 hundred. 165 hundred. Main battery armor-piercing shell. Train on the second armored cruiser from left 102 degrees. Ship's speed 26 knots, course ESE. 170 hundred. Our opponent has two masts and two funnels, also a small funnel close up to the foremast. Deflection left 10. Difference in range, −1. 164 hundred." Still there was no order to fire from the flagship.

It suddenly became clear that both sides were seeking a decision at medium range. Meanwhile I obtained a good view of the enemy. The six large ships reminded me of the day on which I went out to meet the English squadron in Keil Bay to carry greetings to the English admiral. Again a haughty English squadron was approaching, but this time the greeting would be quite a different one. How much larger and more ominous the hostile ships appeared, especially

when magnified 15 times. I now recognized them as the enemy's six newest battle cruisers. Six battle cruisers against our five. About this same proportion prevailed throughout the fight. It was an elevating and a majestic sight to witness these gray giants in the rôle of fate steam toward us.

The six ships, which at first had been steaming in two columns, now formed line. Like mammoth creatures of prehistoric days, they pushed each other aside with slow, measured movements.

But there was something more important to be done than to stand gazing. The measured ranges constantly grew smaller. When the range was 165 hectometers, I gave the order "Armor-piercing shell." That was the shell for short-range engagements. Everyone in the ship now knew that it was going to be a close-up fight, for I had often explained to the men how the two types of shell should be used. I continually sent out to the guns the ranges received by the range takers. Immediately after the change in course at 5.35 p. m. the signal was hoisted on board the flagship, "Fire distribution from the left." That meant that each German ship should take an English ship under its fire, counting off from the left wing. Accordingly we five German battle cruisers had to bring five English ships under fire, and the second ship, which I identified as of the *Queen Mary* class, fell to the *Derfflinger*. She proved to be the *Princess Royal*, a sister ship of the *Queen Mary*. Everything was ready; the tension increased every second; but still I did not dare to give the first order to fire, as I had to wait for the signal "Open fire" from the flagship. The enemy, too, still waited, approaching ever closer and closer.

"150 hundred" was my last order. Then a dull crash, and I looked forward: The *Lutzow* was firing her first salvo and simultaneously the signal "Open fire" was run up. At the same moment I called "Salvo—fire," and then our first salvo thundered forth. Our followers immediately fell in, and we saw among the enemy everywhere the flash of guns and rolling clouds of smoke—the battle was on. My recorder in central wrote down: "At 5.48 p. m. ship turns to starboard. Range difference, minus 2. 150 hundred. Salvo—fire." Almost 30 seconds passed before our impact indicators—this time all three sounded together. The new batteries have worked well. The points of impact lay close together, but were "over"; that is, fell behind the target and too far to the right. "Deflection scale 2 points more to the left. 4 back. Again." Those were the commands for the next salvo. "4 back" meant that the ensign at the sight telegraph should shift the indicator of the telegraph 400 meters. "Again" meant that as soon as he had made his adjustment, he himself should give the order from the gunnery central: "Salvo—fire." This relieved the gunnery officer and, furthermore, it prevented the order to fire from being given when perhaps the gun

had not yet been adjusted to the new sight. The ensign in the central was able to tell by means of an electric indicator, in the case of each gun, whether the sight has been correctly adjusted or not.

At the sight telegraph in central sat Ensign Stachow, a young chap 17 years old, who served the sight telegraph and sight indicator, transmitted my orders to the gun turrets, and regulated permission to fire. His telephone headpiece was connected with mine and in this way I could keep track of all orders given by him. Up to the close of the battle the young ensign coolly and skillfully regulated the fire discipline of the main and secondary batteries; only at the beginning of the firing did he make a mistake.

The second salvo burst forth. Again it was "Over." "4 back," I commanded. The third and fourth salvos were also over, although after the fourth salvo I had ordered "8 back." "Great heavens. Ensign Stachow, what is the matter?" I roared. "Once more 8 back." The firing list showed later that the first "8 back" had probably not been understood by the ensign; in any case he had not made the corresponding adjustment. Now the "8 back" came into effect. The sixth salvo, fired at 5.52 p. m., straddled the target, three shots over and one shot short. Meanwhile, we had approached to 119 hectometers as the sight indicator had at first run with 2 hectometers and then with 3 hectometers decrease in range per minute, and I had already traversed 16 hectometers. We had now been four minutes in the fight and had just succeeded in getting on our first salvo. That was not very satisfactory work. At first all the shots went beyond the target. This was due to the inaccurate measurement of the initial range and a delay in first reports of the measured range. I explained these great errors in measuring in the following manner: The range takers were deceived by the first view of the enemy monsters. Each one saw the hostile ship in his range finder magnified 23 times. At first all thoughts were concentrated on the appearance of the enemy. Each one was busy trying to determine in his own mind where the enemy was. Thus, when the order "Open fire" suddenly came, the measured range was not accurately set. The mistake can not be charged to a lack of ability, for during the rest of the battle the ranges were measured very accurately; nor can any doubt be entertained as to the efficiency of our range finders, as, on the contrary, our Zeiss stereopticon base-line apparatus during the battle thoroughly proved its worth. The range-finding officer reported to me later that the measurements on all range finders, even at long ranges, seldom varied more than 3 hectometers.

Precious moments had been lost, but now I had my aim and at 5 hours 52 minutes 20 seconds the recorder wrote down my order "Good; fast." "Effect." "Good; fast," means that Ensign Sta-

chow in central gave the command every 20 seconds for the main battery "Salvo—fire," and the word "effect" means that the secondary battery should immediately after each salvo of the main battery fire two salvos as quickly as possible. An ear-splitting, deafening roar began. We fired on the average one powerful salvo, including the secondary battery, every seven seconds. Whoever had witnessed firing on board a dreadnaught with service ammunition will be able to form some idea of what that meant. It was impossible to obtain any information while the salvos were being fired. Thick masses of powder smoke continuously rolled about the muzzles of the guns forming huge smoke clouds, which for seconds at a time hung before us like an impenetrable mask and then passed over the ship through the action of the wind and the speed of the vessel. It thus happened that for seconds at a time we were not able to see the enemy, and that our conning tower was enveloped in very thick smoke. Naturally, rapid fire of this kind from both calibers could be maintained for only a short time. It demanded almost superhuman effort on the part of the gun crews and the ammunition crews. Moreover, it finally became impossible to distinguish the points of fall of the main and secondary batteries from each other. I then commanded "Secondary battery silent," and for a time checked only the fire of the main battery. As a rule, it did not take long before the shots passed over or fell short of the target, owing to some movement of the enemy, and then the fire was again slowed down. Each salvo then had to be gauged anew, and the shells again fell about the target until one of the shells covered it. Then began again "Good, fast." Once more a salvo crashed forth from the heavy guns every 20 seconds, and in the intervals the secondary battery fired. Unfortunately the secondary battery could shoot only at a range not over 130 hectometers.

It seemed to me amazing that apparently we had not as yet been hit. Only at rare intervals did a stray shot pass in our vicinity. I examined the gun turrets of our target more closely and realized that this ship was not firing at us. She was joining in the bombardment of our flagship. For a moment I observed the third enemy ship; she was firing at the ship following us. No doubt about it. Through some error we had been passed over. I smiled grimly. And now, quite calmly, as if we were in target practice, I brought the enemy under our fire with increasing accuracy. All thoughts of death or drowning were forgotten as it were. The sportsman's joy awakened and everything within me danced with glee during the wild delight of battle and all thought was concentrated on the one wish, to hit the target rapidly and accurately, to land telling shots on the haughty enemy, wherever and whenever it was possible. It was not going to be easy for him to prevent my return home. I had merely whispered

to myself "We are being skipped," but in an instant the whisper passed from mouth to mouth in the gun station, and filled everyone with unbounded joy. Besides we two gunnery officers only the two petty officers at the aim indicator and range finder could see anything of the enemy. Nevertheless, we had left the lookout slits open—not an altogether sagacious procedure—but one could scarcely see the enemy with the naked eye. The men in the gun stations were therefore eager to learn what they could from us.

And so the battle went on. Huge columns of water, from 80 to 100 meters in height, rose where our shots fell; they were almost twice as high as the enemy's masts. Our joy at being passed over did not last long. The mistake had been detected by the other side and we were now often covered with well-aimed salvos. I again examined the gun turrets of our opponent on which I had directed my glass and saw that the guns were now aimed directly at us. At the same time I suddenly made a discovery which filled me with surprise. At every salvo which the enemy fired I clearly saw four or five projectiles approaching through the air. They looked like long, black points. They gradually became somewhat larger and suddenly—boom—they reached us. They exploded on impact with the water or the ship with a deafening roar. Finally, I could quite plainly see whether the shells were going to fall in front of us or pass over us, or whether they were going to honor us individually. Impact on the sea always raised a huge column of water. Some of these water columns up to half their height were poisonous, greenish yellow in color, and doubtless produced by lyddite shells. They lasted fully 5 or 10 seconds before they collapsed. They resembled giant fountains and in comparison with which the famous jets of Versailles were mere child's play. During the later phases of the battle, when the enemy had gotten our range better, it frequently happened that columns of water of this sort fell over the ship, flooding everything, even putting out the fires. The first hit on our ship which came to my knowledge struck above the casemate. It first penetrated a door with a round glass window. Back of this door stood an excellent petty officer, Boatswain's Mate Lorensen, who had been stationed under deck with the reserves, but remained there in order to be able to observe the battle. His curiosity was severely punished; the shell neatly separated his head from his body. We approached our opponent to within 113 hectometers. At 5.55 p. m., however, I was again firing with a sight setting of 115 hectometers, after which the range rapidly increased. At 5.57 p. m. the range indicator was running with an increase in range of "plus 6." At 6 p. m. the range was 152 hectometers, at 6.05 p. m. the range was 180 hectometers, and the enemy then passed out of reach of our guns, as 180 hectometers was our maximum range.

We were able to increase our range slightly beyond this amount by directing the gun pointer to fire no longer at the water line of the enemy but at the upper edge of the funnels, or mast head, and finally at the very top of the mast. But that amounted to only a few hundred meters. After the battle of the Skagerrak our ranges were considerably increased by all kinds of improvements. Now, however, we were powerless in front of the enemy and could not return his fire. This condition lasted up to 6.17 p. m. At 6.10 p. m. our flagship executed a turn of several points to starboard. The enemy had apparently also turned and thus we were rapidly approaching each other again. At 9.19 p. m. the range was again only 160 hectometers; 16 kilometers is in fact a pretty good distance, but the good visibility and the very clear points of fall made these ranges appear to us really small. The Zeiss lenses in our periscopes were excellent. I was able to make out, even at the greatest ranges, all the details of the enemy ships, for example, all the movements of the gun turrets and the individual guns which were brought to an approximately horizontal position for loading after each shot. Before the war no one in our navy believed that it would be possible to fight effectively at ranges above 150 hectometers. I recall clearly various war games which we had played before the war in the Casino at Kiel, under the direction of Admiral von Ingenohl, in which all effect from shots above 100 hectometers was ruled out on principle.

How did things seem to be going with the enemy at this time? At 6 p. m. his rear ship, the *Invincible*, was blown into the air. I did not see her, as my attention was fully absorbed in directing the fire against the second ship. It was also impossible to hear the noise of the explosion, which must have been great, owing to the internal uproar in our own ship and the noise made by the exploding enemy shells in our vicinity, though we were able to hear the report of the enemy salvos as a dull roar when our own guns were silent for a moment. In the after gun station the explosion of the *Indefatigable* was observed and recorded. The *Indefatigable* had been taken under fire by our end ship, *Von der Tann*, and destroyed by the excellent direct fire of that ship. The successful fire control officer of the *Von der Tann* was the first gunnery officer of that ship, Lieut. Commander Mahrhols.

With the English ships, the northwest wind carried the smoke of their guns past their ships to windward.[1] In this way the view of the English was often obstructed and their firing made difficult. But as the conditions of visibility were still more unfavorable toward the east than toward the west, the English battle cruisers had decided to take up a position which was tactically unfavorable. We were but

[1] The term "feuer luv" is used in battle to indicate the side from which the firing is done. The side turned away from the enemy is called "feuer lee."

little disturbed by the smoke from the enemy's guns, as it was sufficient with our stereoptical range finders if the range taker could see merely a little bit of the top of the mast.

At 6.17 p. m. I again took the second battle cruiser under fire on the port hand. I supposed that it was the same ship, the *Princess Royal*, at which I had already been firing. As a matter of fact it was the *Queen Mary*, the third ship in the enemy line. This came about through Admiral Beatty's flagship, the *Lion*, dropping out of the enemy line for a short time just at the moment that I was selecting my target, and owing to the smoke covering the enemy line in its withdrawn position, this maneuver was not in any way visible to us. From the reports published later in the English papers, it appears that Admiral Beatty changed over from the *Lion*, whose conning tower had become useless, to the *Princess Royal*. He must have changed his flagship, therefore, exactly as our own Admiral Hipper did somewhat later in the battle. Our flagship, the *Lutzow*, had kept the *Lion* continuously under a vigorous and effective fire of explosive shell. The gunnery officer of the *Lutzow* had preferred to use up all his explosive shell before changing to another type of munition, owing to the unfavorable ballistic effects which this might have. The *Lion* had been forced to leave the line for a considerable time in order to extinguish the fires raging in her. It thus happened that I was firing at the *Queen Mary* from 6.17 p. m. on. Certain difficulties in conducting the fire now arose, owing to the thick smoke from the powder and from the funnels collecting on the glasses of the periscope above the deck of the gun station, so that it became almost impossible to see anything. At such moments I had to depend entirely upon the observations of the gunnery observation officer in the fore top, Lieut. von Stosch. This excellent officer observed and reported the fall of the shot with astonishing coolness and self-possession. And his excellent spotting of the shot, upon the accuracy of which I could absolutely depend, contributed not a little to the success of our guns. While we could see nothing, Lieut. von Stosch in his airy perch, 35 meters above the surface of the water, kept his periscope accurately trained on the enemy. A control system indicated on my periscope the bearing of the fore-top periscope. My gun pointer followed this bearing with his indicator and in this way we aimed all our guns on the enemy without being able to see him. Naturally this was merely an expedient. Ensign Bartels, who stood near me in the gun station and who aided me during battle by calling out the averaged ranges by the aid of my range-difference indicator and by observing the enemy through the lookout slits was always very quick in coming to my aid by wiping off the glasses from the gun station with cleaning rods which he had specially prepared for that purpose. In later phases of the battle, as the water

thrown up by the enemy shell frequently broke over the ship and the thick smoke constantly adhered to the wet glasses, he had to clean the glasses almost after every shot. Finally, the cleaning rods themselves became soiled, and with a heavy heart I frequently had to send a man to the roof of the conning station to clean the glasses, where he was fully exposed to the danger of being hit by the enemy's shells or fragments of explosives. This duty was generally performed by my orderly (messenger) from the gun artificers' crew, Artificer Meyer, who had remained on the forward bridge near the gun station during the entire battle until finally fate overtook him and a fragment of shell shattered his leg below the knee.

As I have stated above, from 6.10 p. m. on both lines were steering a slightly converging course toward the south. At 6.15 p. m. we observed that the enemy was sending out his torpedo boats for attack. A little later our torpedo boats and the small cruiser *Regensburg* broke through our line and rushed forward for attack. A small independent naval battle now developed between the two lines of contending battle cruisers. About 25 English destroyers and an equal number of German destroyers engaged in a stubborn fight with their guns and thus prevented either side from making successful use of the torpedo boat against the battle cruisers. About 6.30 p. m. both sides fired a few torpedoes against the line, but without results. For us this battle of the torpedo boats was a magnificent sight.

The two lines constantly drew nearer to each other during this torpedo-boat battle, and now the most interesting gunnery duel of the entire day took place. I saw that the *Queen Mary* had selected the *Derfflinger* as target. The *Queen Mary* fired more slowly than we, but to make up for this usually fired full salvos. As she was armed with eight 34.5 centimeter guns, this meant that she usually discharged at us simultaneously eight of these enormous shells which the Russians called "trunks" in the Russo-Japanese war. I saw the shells approaching and must state that the enemy fired very well. All eight shots usually fell very close together, but almost always were either over or short; only twice did the infernal hail descend fully on the *Derfflinger*, and even then only one shell hit each time.

We fired as if we were at target practice. The head telephones worked beautifully. Every one of my orders were correctly understood. Lieut. von Stosch announced with deadly certainty the exact position of the impacts. "On; two hits!" "On; the entire salvo hit the ship!"

I endeavored always to fire two salvos for the enemy's one. I was not always able to do this, as the enemy fired his full salvos with marvelous rapidity. I observed that the gunnery officer on the

Queen Mary was firing with central control by means of the celebrated Percy Scott "firing director," as all the guns were fired absolutely simultaneously and the shell therefore fell at the same moment. The English gunnery officer was apparently standing in the foretop where he was able to see over the smoke of the guns and from there fired by electricity. This possiblity meant a great advantage for the English ships. Unfortunately we had not devised arrangements for indirect firing from the foretop until led to do so by the lessons of the battle. I myself later contributed not a little to the introduction of indirect shooting in our navy, and also conducted the first indirect firing from the *Derfflinger* in accordance with the process invented by me which was later generally introduced under the name of the "Derfflinger process."

The *Queen Mary* and the *Derfflinger* waged a regular gunnery duel above the torpedo battle raging between us, but the poor *Queen Mary* had a hard time of it. In addition to the *Derfflinger*, the *Seidlitz* was also firing at her. The gunnery officer of the *Seidlitz*, Lieut. Commander Foerster, was one of our ablest gunners, who had been tested in all the previous engagements of the ship and was cool-blooded and of quick decision. The *Seidlitz* had only 28-centimeter guns on board. These projectiles could not penetrate the thickest armor of the *Queen Mary*. But each ship had thinly armored portions, the perforation of which by the 28-centimeter shell, could produce great damage.

The good functioning of our impact indicators prevented Lieut. von Stosch and me from ever confusing our points of all with those of the 28-centimeter guns of the *Seidlitz*. As the ranges were always greater than 130 hectometers, the 15-centimeter guns of both ships could not then be used in the fight against the *Queen Mary*. A simultaneous bombardment of the same enemy by two ships was only possible when each ship used only its heavy guns. If both the 15-centimeter batteries had meanwhile been firing, no one could have distinguished the impacts from each other.

My recorder made the following record in central for the period from 6.22 p. m. to 6.26 p. m.:

Firing list during the destruction of the "Queen Mary."

Time.	Deflection.	Range, in hectometers.	Deflection.	Commands for range telegraph, etc.
6 hours 22 minutes	52°	140	Left 10..	R. D., −3!
6 hours 22 minutes 40 seconds	52°	139	Left 16..	2 for!
6 hours 23 minutes 45 seconds	52°	137	Left 14..	1 for!
6 hours 24 minutes 20 seconds	52°	135	Left 14..	Good; rapidly!
6 hours 24 minutes 40 seconds	52°	134	Left 14..	
6 hours 25 minutes	52°	134	Left 14..	
6 hours 25 minutes 20 seconds	52°	132	Left 14..	
6 hours 25 minutes 45 seconds	52°	131	Left 14..	
6 hours 26 minutes 10 seconds	52°	132	Left 10..	2 for! Great explosion on board the enemy; target changed to left on the second battle cruiser from the left.

It appears from this list that the deflections of the target as given in degrees remained practically the same and that therefore the ship steered an excellent course throughout those few minutes which were so important for the battery.

About 6.26 p. m. occurred the historical moment in which the *Queen Mary*, the proudest ship of the English fleet, met her end.

From 6.24 p. m. on, each one of our salvos had landed on that ship. The salvo fired at 6 hours 26 minutes 10 seconds p. m. fell after the terrific explosion had begun inside the *Queen Mary*. At first a yellowish red flame appeared in the forepart of the ship. This was followed by an explosion, which in turn was succeeded by a much more violent explosion amidships, which hurled black pieces of the ship into the air, and immediately thereafter, the entire ship was shattered by a terrific explosion. Enormous clouds of smoke were developed. The mass fell together amidships; the smoke covered everything and rose higher and higher. Finally, nothing remained where the vessel had been but a thick black cloud of smoke. At the water line this cloud of smoke was of small extent but it broadened as it leaped into space and seemed almost like a huge pine tree. The column of smoke, according to my estimate, was from 300 to 400 meters in height.

In the Times of 9 July, 1916, a gun captain on board the *Tiger*, which ship was astern of the *Queen Mary* in the battle, wrote the following description of the sinking of the *Queen Mary:*

"As the German squadron again engaged us it concentrated all its guns on the *Queen Mary*. They had tried in vain for the correct range for several minutes, but suddenly something remarkable hap-

pened; each shell which the German fired seemed suddenly to hit the battle cruiser. It was almost as if a cyclone was devastating a forest. The *Queen Mary* seemed to roll over slowly to starboard; her mast and funnels were gone; a huge hole yawned in her side. She listed still further. The hole in her side disappeared under the water which now rushed in, and the ship capsized. A minute and a half more and all that could be seen of the *Queen Mary* was her keel; then that also disappeared."

Later in the day our torpedo boats picked up two survivors of the *Queen Mary* and took them as prisoners to Wilhelmshaven; one was an ensign and the other a seaman. According to them, more than 1,400 men were on board the *Queen Mary*, among whom was a Japanese prince, the naval attaché at London. The commander of the *Queen Mary* was Capt. C. J. Prowse. The English Admiralty stated in its report of officers lost on board the *Queen Mary:* "With the exception of four ensigns, all officers present on board were lost."

No sooner had the *Queen Mary* disappeared in a cloud of smoke than I looked about with my periscope for a new target. I swung the periscope to the left and to my surprise saw that two battle cruisers were still there. I then realized for the first time that I had been firing at the third ship. The *Lion* had in the meantime placed herself at the head of the enemy line. Our target was once more on the *Princess Royal.*

The following orders were recorded in central after the destruction of the *Queen Mary:*

Time.	Deflection.	Range in hectometers.	Slide sight.	Commands for range telegraph, etc.
6 hours 27 minutes 15 seconds	47°	122	Left 12..	Fire: 2 for.
6 hours 28 minutes	60°	124	Left 14..	4 for.
6 hours 28 minutes 30 seconds	83°	126	.....	
6 hours 29 minutes 20 seconds	88°	140	Left 14..	
6 hours 30 minutes 20 seconds	88°	146	Left 10..	4 for.
6 hours 31 minutes 20 seconds	87°	150	.....	
6 hours 32 minutes 10 seconds	87°	157	Left 2...	4 for.
6 hours 33 minutes 10 seconds	105°	164	.....	

One minute and five seconds had therefore elapsed since the last salvo had fallen on the *Queen Mary* to the first salvo fired at the *Princess Royal.* I had had the range of the latter ship measured by the range taker in the gun station. The measured range was only 122 hectometers. I fired the first salvo with this range, but it fell short; likewise the next two salvos, so that I increased the range considerably for the fourth salvo. The range taker had apparently not at once realized that the range was no longer decreasing but on the contrary was rapidly increasing after the sinking of the *Queen Mary.* It appears in the record from the constantly changing

deflections that the ship was steering a very irregular course, and that she turned out to port. The enemy was taking his bearings now somewhat more carefully. There was no prospect of a successful rapid fire. As a rule a full minute elapsed between salvos. We had to wait each time to observe the points of fall. When we had observed them, new commands had to be given usually for deflection and range, and for the sight periscope.

At 6.36 the range was 168 hectometers.

Meanwhile we saw that the enemy was being reinforced. Four large ships appeared behind the line of battle cruisers. We soon recognized them as ships of the Queen Elizabeth class. We had often discussed these ships in the navy. They were battleships powerfully armed with eight 38.1 centimeter guns, with a displacement of 28,000 tons, and a speed of 25 knots. Their speed, therefore, differed very little from ours—26 knots—but they fired projectiles almost twice as heavy as ours. They engaged in battle at enormous ranges. We now received a violent fire and henceforth steered continuously a zigzag course. From 6.36 p. m. to 6.45 p. m. I did not fire at all with heavy guns. This was chiefly due to the smoke produced by the torpedo-boat engagement, which kept up between the two lines and our torpedo defense guns which were now brought into use by the third gunnery officer, Lieut. Hausser. Some of the English torpedo boats were now pushing their attack to devilishly close quarters. As I could see nothing of the large ships, I had ample opportunity to observe the surging of the battle. It was a marvelous picture. Now the *Regensburg*, with Commander Heinrich on board, the former commander of the *Derfflinger*, surged ahead of our lines at the head of the flotilla, maintaining a rapid fire at the same time our torpedo boats and the enemy boats closed in to the shortest ranges. I saw two of our boats lying dead in the water. They were looking badly and it was clear that they were doomed. Other boats came alongside in the midst of the fire, and took off the entire crews. One English destroyer sunk; others lay dead in the water unable to move. Our 15-centimeter salvos crashed forth incessantly. Lieut. Hausser got the range of several boats which he attacked one after the other with telling effect. On one boat he made visible hits; the boat stopped suddenly, and then disappeared in a cloud of smoke.

What a pity that we had no marine painter on board with us. The celebrated painter of marine views, Kaus Bergen, had often accompanied us on our sweeps in the North Sea. This time something had prevented him from doing so. He regretted this very much, but nevertheless he has become the most successful painter of the battle of the Skagerrak. Unfortunately, we were also strictly forbidden to take photographs on board. No apparatus for this purpose was

allowed on board ship. This was done in an effort to protect ourselves against spying. That is why not a single picture was taken in the entire German fleet during the battle of the Skagerrak.

The recorder in the secondary battery central, Ensign Hauth, who had kept excellent records throughout the entire fight had noted the following, while the torpedo boat defense guns were being used:

"6.36 p. m., Secondary on the torpedo boats! By aim indicator! 60 hundred! On the torpedo boat farthest to left! Fire! 70 hundred! Fire! 64 hundred! Fire! 60 hundred! Fire! Fire! Good; rapidly! Fire! Fire! Fire!

"6.42 p. m., Secondary battery stand by (abwarten)! 68 hundred! Fire! 55 hundred! Fire! 50 hundred! Fire! Fire! 56 hundred! Fire! Fire! 70 hundred! Fire! 68 hundred! Good; rapidly! Fire! Fire! Fire! 70 hundred! Fire! Fire!

"6.45 p. m., Ship turns to port! Fire! 80 hundred! Fire! 84 hundred! Fire! Fire!

"6.48 p. m., secondary battery stand by!"

At 6.48 p. m., the torpedo boat defensive fire ceased and at 6.50 the entire formation altered course to north-northwest. This maneuver brought Admiral Hipper, with the battle cruisers about 7 miles to the fore of the head of our battleships, which were steering a course about north-northwest at maximum speed, and whose head immediately thereafter engaged in the attack on the ships of the *Queen Elizabeth* class.

We learned later from the numerous hits with 10.5 centimeter shell that the English torpedo boats also had subjected us to a pretty intense fire. In the general confusion of the battle this had escaped me. The 10.5 centimeter shell naturally exploded without effect against our armor and only on unarmored portions of the ship did they do any damage, especially in the rigging where they destroyed our radio antennæ and some gun telephone connections. One officer found an unexploded 10.5 centimeter shell in his bunk after the battle when he was about to turn in.

Between 6.45 p. m. and 6.50 p. m., I had fired eight salvos at 180 hundred with heavy guns, at the *Princess Royal*, but apparently without any noticeable success.

Our sudden turn to north-northwest course brought the head of our third squadron into view, the proud ships of the Konig class. Everyone breathed somewhat more easily. Having had in addition to the battle cruisers the five British dreadnaughts in front of us with their 38's, it had not been so very comfortable for us.

At 6.50 p. m. I announced to the guns "Ship is turning slowly to starboard! Our third squadron is here!"

Thus ended the first part of the battle. We had seen an English dreadnaught fly to pieces under our fire like an exploded powder

cask. The *Derfflinger*, however, emerged from the battle with her fighting powers undiminished.

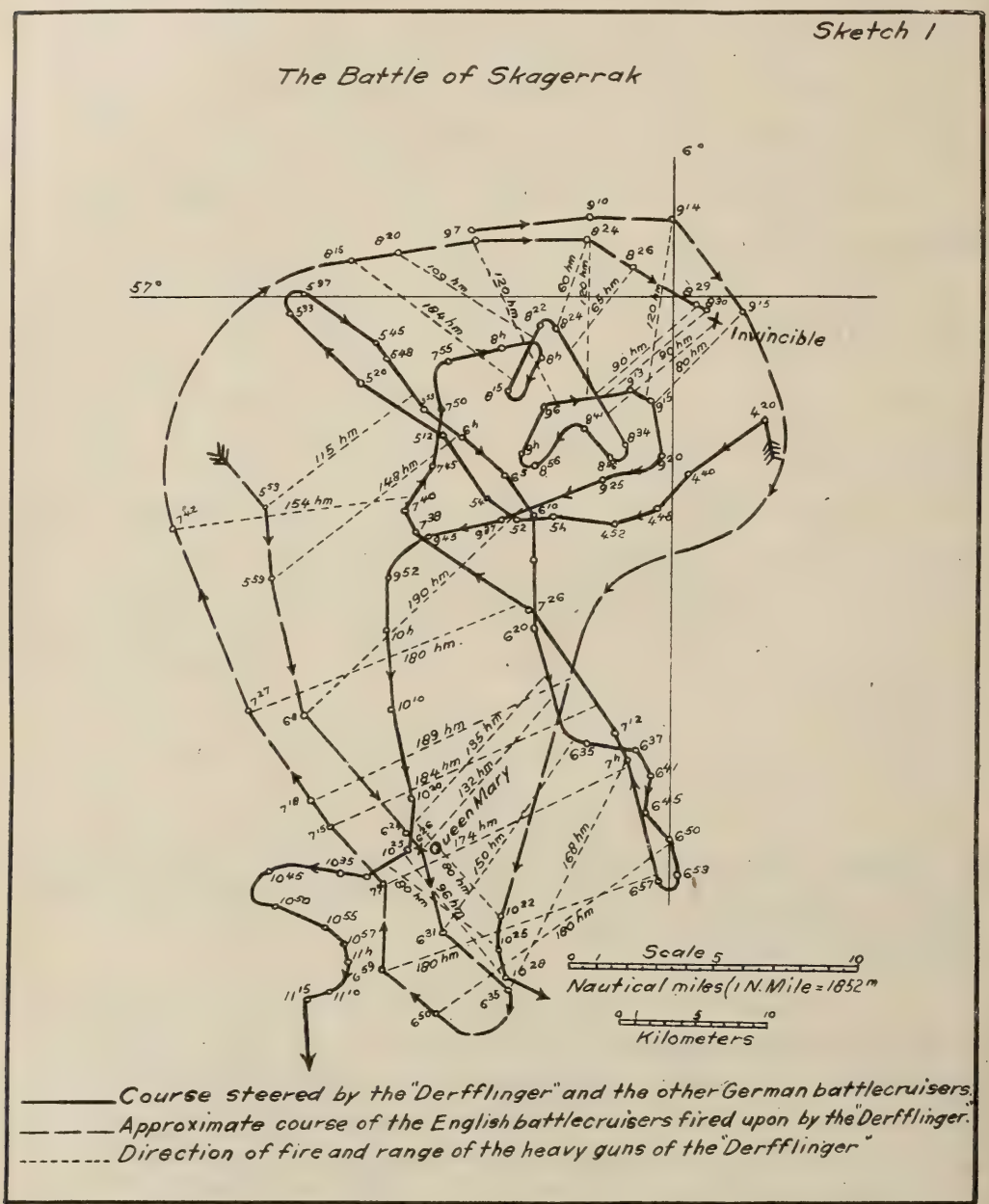
What wonder that we thought of new battles with the highest courage and full confidence of victory. We were in close battle contact with our best battleship squadron and we believed that we had opposite us only the four remaining battle cruisers and the four ships of the *Queen Elizabeth* class. Flushed with the pride of victory, we hoped to demolish the entire enemy force opposing us We had acquired unshaken confidence in our ships. It seemed to us absolutely impossible that our proud vessels could be smashed to pieces in a few minutes like the *Queen Mary* and the *Indefatigable* had been. On the contrary, I had the feeling that we could cause each English vessel to explode in a very short time. If only our ship would steer a constant course for a time and the range was not too great; if possible, not over 150 hundred. We were eager to win new laurels. The high enthusiasm running through the ship was perceptible to everyone. The gun crews had done marvelous work by always having their guns ready, even during the most rapid fire, immediately the gong sounded. At the end of an hour of continuous firing, the gun tubes were already very hot, and their gray paint began to smoulder and turn brown and yellow. The calm manner in which the commanding officer had managed the ship also had an excellent effect. He had often helped me with information, but on the whole had given me a free hand, especially as to the choice of the enemy ship at which I was to fire.

CHAPTER VII.

The Second Phase of the Battle of the Skaggerak (6.55 p. m. to 7.05 p. m.)—Engagement with the Fifth Battleship Squadron—Beatty's Flanking Maneuver.

The first phase of the battle was gratifying and from the gunnery point of view interesting; the second gave us as great cause for dissatisfaction as the first did for rejoicing. The enemy had come to have a profound respect for the effect of our shots, and now in the wild chase to the north had held himself as far as possible beyond our range, keeping us meanwhile within the reach of his own long-range guns. It will be seen from Sketch I that the ranges during the second phase of the battle scarcely fell below 180 hectometers. I fired only for the purpose of ascertaining whether or not the enemy was really out of range. In doing this I limited myself to individual shots from a single turret, in order to save ammunition. The upper edge of the funnels or masts were used as the point of aim for our guns. The enemy's fire also was not good at these long ranges. It is true, his salvos fell close together with a

dispersion at most of from three to four hundred meters, but the fire control was not very successful, perhaps owing to poor visibility; at any rate, salvos as a rule fell at very irregular distances from our ship. Nevertheless, we already had received some bad hits, and two or three heavy shells struck us during this phase of the battle. Whenever a heavy shell struck the armor of our ship, the crash and


Sketch 1
The Battle of Skagerrak
6°
57°
Invincible
Queen Mary
Scale 5
Nautical miles (1 N. Mile = 1852 m)
Kilometers
Course steered by the "Derfflinger" and the other German battlecruisers.
Approximate course of the English battlecruisers fired upon by the "Derfflinger."
Direction of fire and range of the heavy guns of the "Derfflinger"

detonation was followed by a vibration of the entire ship, and even our conning tower trembled. The explosion of the shell inside the ship produced a more muffled report which was propagated throughout the ship by numberless speaking tubes and telephones.

The four English battle cruisers were running to the northward, and because of their superior speed we were not able to keep up with them. At 7.21 p. m. the commander in chief made the signal "Take the battle cruisers in pursuit!" Our battle cruiser squadron, however,

could not maintain more than 25 knots for any length of time, and the English were fleeing easily at 28 knots. We did not at that time entirely understand the object of the enemy's maneuver. We supposed that he was hastening to join his main body, which the maneuver of the English cruisers had led us to understand was somewhere near. As a matter of fact, Admiral Beatty, by fully turning our flank while we were running at maximum speed, and finally encircling us, had executed a magnificient maneuver, and his ships had shown a marvelous tactical efficiency. He had succeeded in crossing the T in an absolutely perfect manner. By capping us, he had compelled us to turn out, and thus finally brought us entirely within the circle of the English battleships and battle cruisers. In the latter phase of the battle, we could no longer as a rule distinguish individual enemy ships that happened to be in front of our guns; I can not therefore say with certainty at what time or if at all we later engaged Beatty's four battle cruisers.

After the gradual disappearance of the four battle cruisers, we were still confronted by the four powerful ships of the fifth battleship squadron, the *Malaya*, the *Valiant*, the *Barnum*, and the *Warspite*.

They could not have been making very much speed at this time, as they soon came within range of our third squadron and were taken under fire by its leading ships, especially by the flagship *Konig*. The four English battleships thus at times came under the fire of at least nine German ships, of which five were battle cruisers and perhaps four or five battleships. According to my firing record, we fired from 7.16 p. m. at the second battleship from the right, hence at the ship following the enemy leading ship. I had the guns fired at this great range with explosive shell.

The second phase of the battle passed without any great incidents for us. In certain respects this engagement with an enemy inferior in numbers but superior in fighting power, who held us under fire at ranges at which we could not reach him, was in the highest degree depressing, nerve racking, and harrowing. Our only means of defense was to drop out of the line for a moment when we observed that the enemy had gotten our range accurately. As the enemy could not foretell these movements, we quickly escaped from the hail of shell. I should state here that these small changes in course for the purpose of evading the enemy's rain of shell are not entered in the sketch, as we always immediately returned to our former position in the battle line at maximum speed.

Very soon after this conditions were greatly changed.

CHAPTER VIII.

The Third Phase of the Battle of the Skagerrak (7.50 p. m. to 9 p. m.)—Hot Engagement with Battleships, Cruisers, and Torpedo Boats—Destruction of the "Invincible"—The "Derfflinger" Forced to Stop to Clear Away her Torpedo Nets.

At 7.40 p. m. enemy small cruisers and destroyers started an attack with torpedo boats. We were steering a course north-northeast at the time; that is, about six points to starboard.

The visibility was now quite poor, so that it was difficult to see the English ships. We fired at the small cruisers and torpedo boats. At 7.55 p. m. we turned to the east, and at 8 o'clock the entire battle-cruiser squadron moved off in echelon on a southerly course as the torpedo boats attacked us. In this way we avoided the enemy's torpedoes very successfully. At 8.12 p. m. we again turned toward the enemy. During this time we had fired only occasionally with the main and secondary batteries. At 8.15 p. m. we received a heavy fire. All about us were flashes of light. We could make out the ships' hulls only indistinctly, but everywhere I could see along the horizon were enemy ships. As I could not see which was the beginning and which was the end of the enemy line, I could not take "the second ship from the right under fire, but selected a ship which I could see particularly well. And now a bitter fight began. In a short time the uproar of battle reached its height. It was perfectly clear to us now that we had opposing us the entire English fleet. I realized at once by its huge hull that I had taken a giant battleship under fire. Cruiser and torpedo-boat engagement still raged between the two lines. Suddenly I saw in my periscope a German small cruiser pass by me in flames. I recognized the *Wiesbaden*. She was almost entirely shrouded in smoke, with only her stern showing, and the gun stationed there was firing incessantly at a small English cruiser. Brave *Wiesbaden*. Valiant crew of this good ship. Only a fireman, Zeene, was rescued by a Norwegian fishing boat, after he had drifted for three days on a raft; all the rest, including the poet, Gorch Fock, who loved the sea so deeply, had crowned their service to Emperor and country with a seaman's death. The *Wiesbaden* was effectively shelled by an English small cruiser. Again and again the shells hit the poor *Wiesbaden*. Fury seized me, and I abandoned my previous target, had the range of the English small cruiser measured, announced the range and deflection, and "Bang"—a salvo whistled over the tormentor of the *Wiesbaden*. One more salvo, and I had him. A high column of fire shot up to heaven. Apparently a powder room had exploded. The cruiser turned out and fled at high speed, during which time I sent two or three more salvos after him. At this moment Lieut. Commander Hausser, who had been firing at the torpedo boats with the secondary battery, asked

me: "Sir, is this cruiser with the four funnels a German or an English cruiser?" I directed my periscope at the ship and examined it. In the gray light the color of the German and the English ships looked almost exactly the same. The cruiser was not at all far from us. She had four funnels and two masts exactly like our *Rostock*, who was with us. "It is certainly English," exclaimed Lieut. Commander Hausser; "May I fire?" "Yes; fire away." I became convinced that it was a large English ship. The secondary guns were aimed at the new target and Lieut. Hausser commanded: "60 hundred." At the moment in which he was about to order "Fire!" something horrible, terrific, happened. The English ship, which I meanwhile supposed to be an old English battle cruiser, broke asunder, and an enormous explosion, black smoke, and pieces of the ship whirled upward, and flame swept through the entire ship, which then disappeared before our eyes beneath the water. Nothing was left to indicate the spot where a moment before a proud ship had been fighting, except an enormous cloud of smoke. According to my opinion, the vessel was destroyed by the fire of the ship just ahead of us, the *Lutzow*, the flagship of Admiral Hipper.

All this took place much more rapidly than the time taken in the telling. The whole thing lasted only a few seconds, and then we had already engaged a new target. The destroyed ship was the *Defense*, one of the older armored cruisers of the same type as the *Black Prince*, which was sunk by gunfire during the following night by the *Thuringen* and other battleships. The ship displaced 14,800 tons, was armed with six 23.4-centimeter and ten 15.2-centimeter guns, and had a crew of 700 men. Of the crew not a single soul was rescued. The ship was blown into atoms and every living being was destroyed by the explosion. As we saw the ship in a good light at a comparatively short distance from us and magnified 15 times by our periscope, we could observe the occurrence very accurately. I shall never forget this sight in all its gruesomeness.

I continued to fire at the large ships. I no longer had any idea what ships they were. At 8.22 p. m. we turned into a southwest course, but in the poor conditions of visibility and the confusion of battle now prevailing, I had no longer any correct grasp of the tactical conditions. At one time it flashed through my mind, "May it not be German ships that we are firing at?" Then the visibility, which varied from minute to minute but which on the whole was gradually growing worse, became somewhat better, and one could clearly recognize the typical English contours and the dark gray color of their paint. I am of the opinion that our light gray paint is better than the dark color of the English. Our ships disappeared much more quickly in the thin mists which were now drifting from east to west.

At 8.25 p. m., Lieut. v. d. Decken reported from the after conning tower: "Heavy hit in the fore part of the *Lutzow;* ship burning; much smoke." At 8.30 p. m. he reported: "Three heavy hits on the *Derfflinger.*" One of these hits had struck the second 15-centimeter casemate gun on the port side, passed through the gun near the center, the fragments of the explosion killing or wounding the greater part of the casemate personnel. Fragments of the explosion had also thrown the first 15-centimeter gun off its carriage and killed or wounded several men in the first casemate. The other heavy hits fell in the after part of the ship.

I now sought my target as far forward as possible at the head of the enemy line. I noticed that the *Lutzow* was now firing weakly. The fires raging in the fore part of the *Lutzow* made it almost impossible to direct the gunfire.

From 8.24 p. m. on I fired at the enemy battleships in a northeasterly direction. The ranges were short, 60 to 70 hectometers, but in spite of this the ships often disappeared from view in the thick mist resulting from weather conditions and the smoke from stacks and guns.

It was almost impossible to observe the points of fall. All the projectiles which fell beyond the target were practically invisible to us, and we gained a fairly correct idea only of the points of fall which were somewhat short. This helped one, however, mighty little. If the gun were again fired at the target according to such points of fall, the white columns of water were no longer visible and one knew absolutely nothing as to where one had really struck. I fired according to the measurements of the range taker in the gunnery station, Seaman Hanel, my trusted man for the past five years. Owing to the thick weather, the measurements were very irregular and incorrect. But as I was without observations, I was forced to fire slowly by these measurements. Meanwhile, we were receiving heavy and well-placed rapid fire from several ships simultaneously. It was obvious that the enemy could now see us much better than we could see him. To those who have ever been at sea this statement will seem ambiguous. As a matter of fact, however, the differences in visibility at sea in weather of this kind vary greatly. Persons on board a vessel enveloped in mist can make out a vessel silhouetted against a clear horizon much more distinctly than the latter can make out the vessel enveloped in mist. The position of the sun plays an important part in visibility conditions. In misty weather the ships which have their shaded side toward the enemy are much more plainly visible than those on which the light shines.

Thus it was that the battle became an unequal, bitter struggle. Several heavy hits fell with terrific force on our ships and exploded with a terrible report. The entire ship trembled in every joint at the

impact of the shell. The commanding officer frequently swerved out of line to avoid the hail of shell. It was no easy firing.

This lasted up to 8.29 p. m.

At this moment the veil of mist lifted as if it had been the curtain of a theater. In front of us, in the middle of the clear portion of the horizon, in full view, and distinctly outlined, stood an enormous battleship with two funnels between the masts and a third funnel close up against the forward tripod mast. She was steaming at full speed on a course about parallel to our own. Her guns were aimed at us, and again a salvo burst forth which fully covered us. "Measurement 90 hundred," shouted Seaman Hannel. "90 hundred! Salvo—fire!" I commanded, and with feverish anxiety I awaited the result. "Over! Two hits!" cried Lieut. Stosch. I commanded: "One back! Good: rapidly!" and in 30 seconds after the first salvo the second left the guns. I observed two shorts and two hits. Lieut. Stosch shouted, "Hit!" Every 20 seconds now a salvo thundered forth. At 8.31 p. m. the *Derfflinger* fired her last salvo at this ship, and then there took place before our eyes, for the third time, the horrible sight which we had witnessed in the case of the *Queen Mary* and the *Defense*. As with the other two ships, several enormous explosions followed each other rapidly, masts fell over, fragments of the ship whirled through the air, a huge black cloud of smoke rose toward the heavens, and out of the disintegrating ship coal dust was scattered in all directions. Flames swept over her, new explosions took place, and then our opponent disappeared from view in a black cloud. I called through the telephone, "The enemy has blown up!" and in the midst of the uproar of battle a thundering hurrah passed through the ship, which was repeated by all the telephones of the gun station and transmitted from battle station to battle station. I breathed a short, intense prayer of thanks to heaven, and called out to my man, "Bravo, Hanel: splendidly measured!" and then gave my command: "Change target to the left, on the second battle cruiser from the right!" and the battle went on.

Who had our enemy been? I did not spend much time wondering about this, but I had supposed the ship to be an English battle cruiser. I had designated her as such in determining my range as it appeared from the record made by the recorder in central. There was no time for discussing the type, so long as we were firing at the ship. There were only a few minutes during which we might have identified her. Only the officers and gun captains, together with the torpedo officers, had observed the ship when she flew into the air. The attention of the commanding officer and his helpers, the navigating and signal officers, was entirely taken up with the management of the ship in cruising in formation. It was difficult to keep place behind the *Lutzow*, which was scarcely able to keep her position in the line.

In writing up the report of the battle afterwards, the majority of the officers believed that the vessel was a ship of the *Queen Elizabeth* class. I felt sure that she was a ship of the *Invincible* class, but I yielded the point, as I was not sufficiently certain. When we examined a fleet pocket manual and compared the silhouettes of the *Invincible* and those of the *Queen Elizabeth* class, the similarity was at once strikingly apparent. We therefore stated in our report of the battle that at 8.30 p. m. we had destroyed with our gun fire a battleship of the *Queen Elizabeth* class. Our service record in the report of the battle ran: "The vessel was blown up in the same manner as the *Queen Mary*, at 6.26 p. m." Reliable observation by the first and third gunnery officer and the first torpedo officer in the forward station, by the second and fourth gunnery officer and by the second torpedo officer in the after station, and by the spotter in the foretop. "Ship of the *Queen Elizabeth* class."

The English prisoners stated at Wilhelmshaven, after the battle: "One of the *Queen Elizabeth* ships, the *Warspite*, listing heavily, had left the line and had withdrawn to the northwest. At 8 p. m. the English destroyer, *Turbulent*, picked up the wireless report that the *Warspite* had sunk."

On the basis of our report of the battle, and of this statement by the English prisoner, we then believed that the vessel destroyed by the *Derfflinger* had been the *Warspite*, and therefore reported the *Warspite* as the lost enemy ship instead of the *Invincible*. We first learned of the destruction of the *Invincible* from the reports of the English Admiralty, and naturally she was added later to the list of losses reported. As a matter of fact, we had been fighting with the *Invincible;* it was the *Invincible* which blew up under our fire, and not the *Warspite*. English reports soon proved this clearly enough.

As early as 3 June, the following appeared in the Manchester Guardian: "The German Admiralty report of 1 June contains a detailed and very correct account of the English losses—with the exception that it mentions the name of the battleship *Warspite* instead of the battle cruiser *Invincible*." The Times report of 16 June, 1916, gives statements of the participants in the battle: "The *Invincible*, the flagship of Admiral Hood, the second admiral after Sir David Beatty, engaged the *Hindenburg*, and after a hot fight, in which, according to the accounts of some of our people, the *Hindenburg* received her deathblow, the *Invincible* sank beneath the waves."

The *Hindenburg* was at that time still under construction; the *Derfflinger* was her sister ship, and everything thus agrees with the English account except the name of the ship. It was the *Derfflinger* and not her still unfinished sister ship, the *Hindenburg*, that had fought with the *Invincible*.

One of the two rescued English officers of the *Invincible* gave a very correct account, especially as regards the time of day of the gunnery

duel between the *Derfflinger* and the *Invincible*. The Times of 12 June, 1916, contains the following statement regarding this engagement: "The father of one of the lieutenants who went down with the *Invincible* received a letter from the two surviving officers of the ship in which the following statement occurs: 'Your son was serving with the admiral and we were in the action with the battle cruiser *Derfflinger*. At 8.34 p. m. a frightful explosion took place, the ship broke in half and sunk in 10 or 15 seconds.' "

On 13 June, 1916, the Times reported: "A letter from the brother of Lieut. Charles Fisher stated: 'We learned from Lieut. Commander Dannreuther, the sole survivor of H. M. S. *Invincible*, that a shell struck in the powder room and produced a terrific explosion there. When Dannreuther returned to consciousness he was floating in the water; ship and crew had disappeared.' "

That the vessels which I fired upon from 8.24 p. m. on ranges of from 6,000 to 7,000 meters, were battle cruisers of Hood's squadron is shown by the official report of Admiral Beatty. He reports concerning the attack of the third battle cruiser squadron, consisting of the *Invincible*, *Indomitable*, and *Inflexible*, as follows:

"At 8.21 p. m. I ordered the third battle cruiser squadron to take its position at the head. This maneuver was splendidly executed by Rear Admiral Hood, who brought his squadron to the head during battle in the most typical manner, worthy of his long experience at sea. At 8.25 p. m. I changed course to east-southeast in order to support the third battle cruiser squadron which at this moment was only 73 hectometers from the leading enemy ships. They were pouring a violent fire into the squadron and forced it out of its southerly course farther toward the west."

On 5 June, 1916, a Reuter dispatch from Edinborough (press telegram, 5 June) states: "When the battle had been going on for a few hours, the *Indomitable*, *Invincible*, and *Inflexible* appeared. This portion of the battle was principally a duel between the heaviest guns. The *Invincible*, after fighting bravely and inflicting considerable damage on the enemy, met her fate and sunk."

I mention these English reports of the battle with the *Invincible* with so much fullness here in conjunction with my own account of the battle, because in the German reports hitherto published the question of whether the *Invincible* was destroyed by gun fire or by a torpedo was left open. For historical reasons, if for no other, I consider it necessary to establish the fact that the *Invincible*, as well as all the other ships which the English lost in the battle, were destroyed by gunfire.

Admiral Hood, commander of the third battle cruiser squadron, who went down with the *Invincible*, was a descendant of the famous English Admiral Hood who won great renown as a strategist and

tactician in the North American revolution under Graves and Rodney, and later as commander in chief in the battle of St. Christopher (1782). During the English-French war, lasting from 1792 to 1802, he commanded the Mediterranean fleet during 1793–94, and occupied Toulon in 1793.

Our heavy guns fired up to 8.33 p. m., according to the records kept by my recorder. At 8.38 p. m. we had turned sharply to the west. After the loss of their leader, the remaining ships of the third battle squadron did not again venture in our immediate vicinity. At 8.50 p. m. the entire ship was ordered to cease firing. A feverish activity began in an effort to extinguish the numerous fires in the ship. We observed a torpedo boat steer up alongside the *Lutzow*. The *Lutzow* was listing and was down deeply by the bow. Numerous clouds of smoke were pouring from the fore part of the ship. Admiral Hipper left the vessel. The torpedo boat cast off and steered for the *Seydlitz*. In passing the *Derfflinger* the admiral signaled: "Commander of the *Derfflinger* will take command until I am again on board ship." Thus it happened that our commanding officer was now leader of the battle cruisers, and he continued in this capacity until 11 p. m., when the admiral finally succeeded in getting on board another ship. This he had not been able to accomplish sooner as the battle cruisers had been almost continuously under enemy fire, steaming at high speed.

The *Derfflinger* herself now presented a pretty bad appearance. The masts and all the rigging were badly damaged by fragments of explosions, the antennæ hung down in wild confusion so that we were able to use our wireless only for receiving. It was therefore impossible to send any regular messages. A heavy shot had torn away the armor plates of the bow, leaving an enormous hole at least 6 by 5 meters in size just above the water line. Water continuously flowed in through this hole when the ship pitched.

While we were steering to the west, the first officer came upon the bridge and reported to the commander: "The ship must be stopped at once. The torpedo net has been shot away aft and hangs directly over port screw; it must be cleared away." The commander order: "All engines stopped." I scanned the horizon, far and wide, with my periscope. At this moment the enemy was nowhere to be seen. We were as yet only loosely in touch with the *Seydlitz,* the *Moltke,* and the *Von Der Tann;* now they hastened up and again took their prescribed positions. It was a most dangerous thing to be compelled to stop here in the immediate vicinity of the enemy. But if our torpedo net should get foul of the screw, we would be lost. How we had railed on board because we had not discarded these heavy steel torpedo nets, weighing several hundred tons. As we almost never anchored in the open sea, they were useless. Moreover,

they protected only certain portions of the ship against torpedo attack and at sea represented a very great danger, since in the suspended condition they greatly diminished the speed of the ship and were almost certain to become entangled in her propellers, which was equivalent to the destruction of the vessel. For these reasons the English had abandoned their torpedo nets shortly before the war. We did not do so until immediately after the battle of the Skaggerak.

The boatswain and turret crew of the turrets Dora and Caesar, under the leadership of Lieut. (junior grade) von Boltenstern, worked like mad to raise the net, secure it with chains, and make fast all loose cables and chains. A few minutes later came the announcement: "Engines can run again." And we were once more immediately under way. The *Lutzow* had now left the line and was steering a course to the south at slow speed. The commander tried to signal to the other ships: "Follow the leader." But all means of signaling had been rendered useless. The signal yards were all damaged, the flags at the battle stations were burned, and the signal searchlights had been shot away. Our brave comrades in arms, however, followed without signal when the commander now led the battle cruisers on the northerly course before the head of our main body.

The pause in the battle lasted until 9.05 p. m.; then shots were again suddenly heard, and once more there rang through the ship the order "Clear ship for action!"

CHAPTER IX.

The Fourth Phase of the Battle of the Skaggerak (9.05 p. m. to 9.37 p. m.)—The Battle Cruisers' Death Journey—Admiral Scheer Withdraws the Fleet from the Encircling Maneuver—Torpedo Boats Attacks—Getting Free of the Enemy.

In the phase of the battle that had gone before we had gone from triumph to triumph. We had learned the meaning of a naval battle in all its wild beauty. Now we were to discover its horrors. During the pause in the battle I had remained in the conning tower without removing my head telephone piece. "Where is the enemy?" I called, as I again looked through my periscope. "Several small cruisers off the port beam," was the answer. In order to spare the heavy guns for larger targets, I ordered Lieut. Hausser to fire at the small cruisers with the 15-centimeter guns. He opened the fire at 7,000 meters. I, meanwhile, searched the horizon, but as no other ships were visible, I again opened fire with the heavy guns on one of the small cruisers that had been reported to me. The enemy ships were once more just visible. I conducted a lively fire at them, and then observed that the ship on which I had aimed my guns was firing

full salvos from her four double turrets. The outline of our enemy became clearer for a moment and I plainly recognized that a large ship was facing us, a dreadnaught of the largest type, with 38 centimeter guns. As I was looking they blazed forth.

The commander in chief had meanwhile realized the danger which threatened our fleet. The head of our fleet was surrounded by a semicircle of enemy ships. Now, we certainly were done for. There was only one way of escaping from this tactically unfavorable position, that was to invert our line by countermarching. This maneuver, however, would have to be carried out unnoticed and undisturbed. The battle cruisers and torpedo boats must cover the movement of the fleet. The commander in chief, at about 9.12 p. m., gave the signal to the fleet to countermarch, and almost simultaneously he gave to the battle cruisers and torpedo boats the historical signal to attack the enemy. At 9.13 p. m. the signal men in our conning station read the signal aloud, and added thereto the explanation which stands after the signal in the signal book: "Ram the enemy! The ships commanded must attack without restraint!" Without moving an eyelid, the commander ordered: "Full speed ahead! Course southeast!" Followed by the *Seydlitz*, *Moltke*, and *Von Der Tann*, we first steered a course to the southeast, then, from 9.15 on, to the southwest, directly toward the head of the enemy line. An infernal fire now descended, especially upon the *Derfflinger*, as leading ship. Several vessels were firing at us simultaneously. I selected a target and likewise fired as rapidly as possible. At first the range which my trusty recorder in the central recorded were 120 hundred; then it decreased to 80 hundred. And still we continued to advance at full speed into this maelstrom of fire, at the same time presenting a magnificent target to the enemy, while he was scarcely visible to us. Lieut. Commander Scheibe, in his account of the battle described this attack as follows: "The battle cruisers which, during the transfer of Admiral Hipper, were temporarily commanded by the commanding officer of the *Derfflinger*, now devoted themselves with reckless zeal to bring the torpedo boats to the enemy line. A thick hail of projectiles fell upon us throughout our course." Salvo after salvo fell in our immediate neighborhood, and shell after shell struck our ship. Those were exciting moments. I no longer had any means of communication with Lieut. von Stosch, the telephone and speaking tube connections with the foremast having been shot away. This compelled me to depend solely upon my own observations of the fall of the shot in firing.

Up to this time I had continued to fire with all four heavy turrets, but at 9.13 p. m. a serious catastrophe occurred; a 38-centimeter shell penetrated the turret armor of Caesar turret and exploded inside. The brave commander of the turret, Lieut. von Bolterstein,

lost both legs, and almost all the gun crew were killed. A charge was ignited in the turret by fragments of the explosion. The fire from the burning charge advanced to the ammunition hoist, where two more charges were ignited, and from there passed on into the handling room, where likewise two more charges were ignited. The cartridges burned with sheets of suffocating flames, which arose into the heavens far above the turret, but they merely burned and did not explode, as the charges of our enemy had done. That was the salvation of our ship. But in spite of that, the burning of the charges was disastrous in its effect. The awful suffocating flames destroyed everything that came within their reach. Of the 78 men making up the turret crew only 5 succeeded in saving themselves by climbing through the hole provided for the ejecting of empty cartridge cases, some of them being severely wounded. The remaining 73 men died together in this catastrophe, meeting a hero's death in the full performance of duty while carrying out the orders of the turret commander.

A few moments after this catastrophe, a second occurred. A 38-centimeter shell landed on the roof of the turret *Dora*, penetrating it, and in this case also exploding inside the turret, creating a new scene of horrors. With the exception of a single man who was hurled out of the turret through the manhole by the pressure of air resulting from the explosion, the entire turret crew, including the personnel of the ammunition room, in all 80 men, went together to their death. Under the leadership of Gun Capt. Arndt, in command of the turret *Dora*, the crew had stuck to their guns with heroic courage to the last second. Here again the burning gas ignited the charges not incased in their protective packings, the flames extending even to the magazine located deep down in the ship. Large tongues of flame mixed with yellow masses of smoke shot up toward the heavens from both afterturrets like two gruesome funeral torches.

At 9.15 p. m. I received the report from the main central station: "Danger from gas in main central. Central must be vacated!" This was somewhat startling. The ship must be in a pretty bad condition when the poisonous gases had made their way into the main central which was so carefully isolated. I gave the order: "Switch to the forward station!" and immediately ascertained that the gun-control apparatus had actually been connected up with the forward station before the central was vacated. Now I could conduct the gunfire only by calling out my orders through a speaking tube to an order transmitter situated below the grating on which I stood. He repeated the orders through his telephone and telegraph apparatus, directly to the gun turrets. This greatly increased the noise of voices in the gunnery station, but it was at any rate still possible to direct the fire. Hit after hit fell upon the ship. The enemy's gunfire was excellent. My heart contracted when I thought

of what must be taking place inside the ship. We in the armored gun station were pretty well off. My train of thought was suddenly interrupted. All at once it seemed as if the whole world were in the throes of destruction. A fearful rushing, a violent detonation, and then everything about us was black; we felt a terrific shock; the whole turret rose upward as if struck by a giant hand, and then fell back trembling to its old position. A heavy shot had struck the gun station about 50 centimeters from where I stood. The shell detonated but did not succeed in penetrating the thick armor, because it had struck at an unfavorable angle. Nevertheless it had torn away huge pieces of the armor. Poisonous, greenish-yellow gasses floated in through the outlook slits into our station. I shouted: "Gas masks down!" and immediately each man pulled his gas mask down over his face. I now conducted the fire in a gas mask, which made it difficult for me to make myself understood. However, the gas soon passed away, and we cautiously raised our masks. We made sure that the gunnery apparatus was all in order. Nothing was destroyed. Even the delicate direction indicators had marvelously escaped, thanks to the manner in which they were installed on springs. A few fragments of explosion had entered through the outlook slits into the forward control station and had wounded some of the men there, among them the navigating officer. The heavy armored door of the command station had been sprung from its place by the great shock and now stood wide open. Two men endeavored in vain to force it back, but this was impossible as it was jammed too tight. Then unexpected assistance arrived. Once more we heard a terrifying rushing and crashing, and like a thunderbolt a 38-centimeter shell exploded under the bridge. Whole deck plates were thrown into the air. A furious blast swept everything that was not nailed and riveted fast overboard. In it vanished, for example, the chart house with all the charts and apparatus, and last, but not least, my beautiful cloak, which I had left hanging in the chart house. And a very remarkable thing had also happened; the armored door of the gun station had been thrown back into position by the terrific shock of the bursting 38-centimeter shell. Truly a polite fellow, the Englishman. As he had opened the door for us, he also closed it again. Had it all been intentional? At any rate, we were very well pleased to have our door closed for us.

Once more I looked for the enemy through my periscope. The salvos continued to fall upon us, but we could see almost nothing of the enemy, who still surrounded us in a huge semicircle. All that we could see distinctly was a mass of monstrous, red-gold flames bursting from the muzzles of the guns. It was but seldom that one caught a glimpse of the ship's hull. I measured the range by the flashes of the guns. That was the only way in which to determine our distance

from the enemy. And without great hope of doing the enemy much damage, I had fired salvo after salvo from the two forward turrets. I could feel how our firing steadied the nerves of the men. If we had ceased our firing at this time, the whole crew of the ship would have been overpowered by despair, for everyone realized that a few minutes more and all would be lost. So long as we kept firing, however, things did not seem quite so desperate. The secondary battery also continued firing; but of the six guns on the side, only two remained in commission. The barrel of the fourth gun was burst wide open through an explosion in the tube, and the third gun was shot to pieces. The two 15-centimeter guns remaining in commission kept up a lively fire together with us.

Unfortunately, the aim indicators in the Bertha turret now broke down. This left me with but a single turret which I could train on the enemy by means of my periscope. The train of my periscope, as indicated by the control apparatus in the gunnery central, was continuously called to the Bertha turret; this was a certain guide for the turret commander, but naturally did not suffice for ships constantly in motion.

Furthermore, the turret commander could not continuously discern the enemy with the turret telescope. All that could really be seen were the fiery flashing eyes which the monster opposite opened from time to time, namely, when a salvo was discharged. I confined my fire to a ship which alternately discharged double shots out of two turrets. The mouths of the guns then looked like two blazing, wide-open eyes. Suddenly, it occurred to me that I had seen something like this before—Sascha Schneider's picture, The Feeling of Despondency, had awakened in me a sensation similar to the one I was now experiencing. It represented a black monster of vague outline sleepily opening and shutting his fiery eyes fixed on a fettered man, ready for the deadly embrace. Our present condition seemed very little different from this to me. Also our struggle with the monster must be fought to the end. The Anna turret, under the leadership of brave Gun Capt. Weber—I had sent the turret commander to the after gun station to replace the fourth gunnery officer who had been detached—continued to fire unflinchingly; and likewise the valiant "Schulzburg," the leader, however, frequently firing at a different target from the one ordered. Without any aim indicator it was impossible to have both turrets fired always at the same fire-spitting muzzle of the enemy.

At 9.18 p. m. we received orders by wireless from the commander in chief: "Maneuver for the head of the enemy line." This meant that we should no longer charge the enemy directly, but that we should keep up a running fight with his leading ships. We immediately turned to a course west by south. Unfortunately the enemy

now stood so far astern that I could no longer see him in the forward station, and the fire control must therefore be transferred to the after station. The necessary switching could, however, be done only in the central station. This station could now no longer be used. It thus became impossible for the moment to control even the two forward turrets. I gave the order: "Turrets independently." For sometime the two turrets fired independently under the direction of their commanders. I observed that the Bertha turret quickly got the range of the target dead astern and kept it under a lively fire. The turret Anna also soon began firing. For some time the enemy stood directly astern of us so that the forward turrets could not reach him, as their angle of train extended only up to 220°. Under these circumstances we could no longer defend ourselves. By turning out, the torpedo officer fired a torpedo at 80 hectometers. Our torpedo boats, which had thus far remained behind us, also joined in the attack. Several flotillas advanced simultaneously. A thick cloud of smoke arose between us and the hostile monsters. A wild tumult of battle again arose before our eyes. It was difficult to distinguish friend from foe. One torpedo boat after another plunged into the smoke, disappearing from view, and then reappearing again for a moment. Others emerged, on their way back, having fired their torpedoes. The flotillas reassembled under our protection and then went forth a second time for the attack. The enemy now disappeared from view, and his shell ceased to fall upon us. We drew a breath of relief. The hostile fire thundered and roared as before but we were no longer a target for the guns. As my recorder had to leave central at 9.15 p. m. with the rest, no records of this part of the battle could be kept.

At 9.23 p. m. the announcement came from central: "Main central again manned." I learned later that the trouble had been caused by thick masses of yellowish gas making their way into central through the speaking tubes from the Caesar turret. In the excitement of the battle no one had noticed it at the time. Suddenly the entire central was filled with it. Everyone put down his gas mask. The order transmission officer, Lieut. Hoch, ordered: "Switch gun control apparatus to forward station," and then had the central vacated. Immediately thereafter, the mechanic, Schöning, courageously, and with his gas mask securely adjusted, returned to the central. He felt his way through the poison-laden gasses which entirely filled the room to the speaking tubes, and closed them with wooden plugs. Meanwhile the electric ventilation was started and in a few moments it had become clearer in the central, the gases were removed by suction, and the order transmitters returned to their stations. It had been absolutely necessary to cease operations for a time.

At 9.37 p. m., as there was no longer any hostile vessel in sight, the order was given to suspend action. All gun crews were summoned on deck to extinguish fires. The forward conning station was burning and enveloped in smoke, and the 15-centimeter gun crews were ordered to extinguish the fire. The gun duel came to a halt, but a stubborn fight against water and fire was going on inside the ship. Notwithstanding the fact that everything possible of an inflammable nature had been removed from the ship, the fire still found something to feed upon, especially in the linoleum, wooden decks, clothing, and oil paint. Toward 10 p. m. we had practically mastered the hostile elements, the fire still smoldering only in places. The Caesar and Dora turrets were still smoking somewhat; thick yellow gas continued to flow out of them at intervals, but this gradually ceased after the ammunition rooms were flooded. None of us would have believed that a ship could withstand so many heavy hits. After the battle was over, we verified about 20 hits with 38-centimeter shell, and an equal number of heavy hits of small caliber. The resisting power of our ship together with the enormous destructive effect of her armament was a brilliant tribute to the builders of our navy, especially to the genial Grand Admiral von Tirpitz.

The *Lutzow* was no longer to be seen. At 9.20 p. m. this had been recorded in the after gun station: "Target covered by thick smoke of *Lutzow*." After that the burning ship disappeared in the constantly increasing gloom. Our battle comrades, the *Seydlitz, Moltke*, and *Von Der Tann,* were, however, still with us. They, too, had been severely punished. The *Seydlitz* in particular had suffered. Huge flames were leaping upward from one of her turrets. Fires were raging in all the ships. The bow of the *Seydlitz* lay deep in the water. Admiral Hipper, when he came alongside the *Seydlitz* in his torpedo boat, had learned that she no longer possessed her wireless outfit and that several thousand tons of water had already entered the ship. Then he wanted to be taken on board the *Moltke*, commanded by Capt. von Karpf, the former commander of the *Hohenzollern*. But as he was about to climb on board, the ship received such an inferno of shells that the commanding officer could not reduce his speed. The *Derfflinger* also was asked by Admiral Hipper what damages she had sustained. When we replied that we were now firing only two 30.5-centimeter and two 15-centimeter guns on the starboard side, that we had 3,400 tons of water in the ship, and that our signaling apparatus was destroyed except our radio receivers, he decided not to come on board. He finally boarded the *Moltke* as soon as the conditions of the battle made this possible. Nevertheless the commander of the *Derfflinger* had continued to direct the battle cruisers during the entire four phases of the battle. The name of Capt. Hartog is inseparably connected for all time with the death voyage of the battle cruisers of

the Skagerrak. A great number of men had been killed on all our battle cruisers. Hundreds had met heroes' deaths in this great attack. But our task, in common with that of torpedo-boat flotillas in covering the retiring maneuver of the fleet, had been brilliantly performed. Admiral Scheer had been enabled to maneuver the fleet fully intact from the threatening encircling. The route over which the fleet retired can be seen in sketch 2. We note that from 7.48 p. m. the fleet steered a northwesterly course in echelon formation and then in column a northeasterly course up to 8.35 p. m. At 8.35 p. m. the fleet had already turned into a westerly course. Sketch 2 shows the path over which the fleet had traveled. We see from it that up to 7.48 p. m. the fleet had steered in a northwesterly course in echelon formation, and then, up to 8.35 p. m., a northeasterly course in column. At 8.35 p. m. the fleet had already turned into a westerly course, in order not to leave the burning *Wiesbaden*, which was continuously under the heaviest fire, in the lurch; after this turned back into an easterly course, and then, at 9.17 p. m., completed the countermarch on the westerly course, which had been ordered at 9.12 p. m., and withdrew under the protection of the battle cruisers and the torpedo-boat flotillas, from the surrounding semicircle. The ships farthest forward, the vessels of the third squadron, came into the battle when they engaged the vessels of the *Queen Elizabeth* class at 7.48 p. m.; and then again when they came within reach of the guns of the encircling English ships upon completing their advance on the eastern course at 8.35 p. m. and at 9.17 p. m. The first squadrons occupying a position at the middle of the line did not use its guns at all during the daytime battle, but had to bear the burden of the night engagement. The second squadron, in consequence of its slow speed, had remained several nautical miles in the rear. By chance, however, it came into the engagement during the last phase of the battle, of which I shall have more to say later on. In consequence of the tactical character, arrangement, and conduct of our fleet, the English ships engaged only our most modern and efficient vessels in the principal actions of the battle. Only in this way could it have happened that we absolutely lost no ship during the battle itself—the severely damaged *Lutzow* was abandoned by her crew on the day after the battle and then torpedoed by us ourselves—while the English lost three of their best ships. This fact is a brilliant witness to the consummate tactical skill of Admiral Scheer and his gifted chief of staff, Rear Admiral von Trother.

CHAPTER X.

The Fifth Phase of the Battle of the Skagerrak (from 9.37 p. m. to 10.35 p. m.)—And the Night of June 1—The Last Gunnery Duel—The Night Battle—Sinking of the "Pommern."

A pause in the battle followed the strenuous efforts of a charge upon the enemy which lasted until 10.22 p. m. On board the *Derfflinger* we began preparations for the night at this time. Almost all of the searchlights had been destroyed. On the starboard side we had only one left; on the port side, two. "Heinzelmänchen" and his helpers had all they could do to execute in a measure all the demands made upon them. I remained on the bridge in constant expectation of coming upon the enemy again. There was a man at every periscope who searched the horizon, and all the telescopes were in use.

At about 10 p. m. we sighted our first squadron steering a southerly course. Our commander, who still had charge of the conduct of the battle cruisers, led our formation toward the head of our main body in order to take up a position further forward. The other battle cruisers followed the *Derfflinger* without any signal. As we were executing this maneuver we and the first cruiser suddeny came under heavy fire from the southeast. It was already growing dark. The gloom had increased rather than diminished. "Clear ship for action!" again sounded throughout the ship, and in a few seconds I had the Anna turret trained on the target and a shot was fired. The prevailing darkness made it impossible to bring the Bertha turret to bear on the target. I fired with the Anna turret as rapidly as possible, but even so there was a pause. A heavy hit struck the Anna turret and bent one of the packing disks of the traverse circle so that the turret jammed. Our last weapon seemed about to fall from our hands.

Again Capt. Weber, with his customary quick decision, ran out of the turret and with the aid of some petty officers and men of the gun crew cut away the packing disk with axes and hatchets and got the turret clear again. In this way we could at least fire a shot now and then. I fired almost exclusively with an estimated range. Only rarely did the range taker succeed in measuring the distance from a flashing. I fired at ranges of 80 hundred, 60 hundred, and 100 hundred and thereabouts. It was impossible to observe the flash. Once more the station had become extremely uncomfortable. Then help arrived from a source where we would have least expected it. Our second squadron, the old ships of the Deutschland class, had stood at the head of the fleet after the countermarch on the southerly course. Admiral Scheer now considered the moment opportune to arrange the fleet in such a way as to be tactically correct for advance toward the south. The second squadron, in consequence of his com-

mand. took up its position at the rear of the two modern squadrons. The chief of the second squadron had just executed this order by leading his squadron westward past the remainder of the fleet and also past us. This brought him between us and the enemy, who was pressing us hard, and who suddenly saw seven large ships advancing against him at high speed. At the same time our indefatigable torpedo boats once more joined in the attack. That was too much for our foe. He turned away and disappeared in the gloom. May we never see him again. A great joy filled our hearts as we suddenly saw ourselves free. I saw all the good friends of my former squadron approaching; the brave *Hessen*, on which I had spent five years; the *Pommern*, the *Schleswig*, the *Holstein*, and others. All kept up and received a lively fire which lasted for a short time. The enemy, however, had had enough. If he had dreamed what kind of ships they were, I do not believe he would have turned away. They were, however, the celebrated German "five minute" ships, for whose destruction the English claimed five minutes would suffice. Now, however, he bravely avoided them.

At 10.31 p. m. my trusty recorder recorded the last shot fired from the heavy guns of the *Derfflinger* with a deflection of 244° and a range of 75 hundred. The long northern day came to a close, and the short night, lasting from 11 p. m. to 2 a. m., began. The battle cruisers received the order for the night: "Take position at end of line." We therefore had the honorable task of protecting the rear of the fleet on the south, while cruising. I do not know where the *Seydlitz* and *Moltke* were during this night. The *Seydlitz*, seriously damaged, had already been fighting desperately to keep herself afloat. Only by the greatest efforts was it possible for the crew of the ship, under her valiant commander, Capt. von Egidy, and her efficient executive officer, Lieut. Commander von Alvensleben, to get the ship into Wilhelmshaven two days after the battle.

Only the *Derfflinger* and the *von der Tann* took their positions at the end of the line on this night. We no longer considered ourselves a very efficient rear guard. Our starboard side was our good side. All six 15-centimeter guns on that side were still intact; but a single searchlight was hardly sufficient. On the port side we still had only two 15-centimeter guns capable of firing. Hence we had to make strenuous efforts to attack the English torpedo boats on the starboard side so far as possible. There we could take good care of them.

As the heavens were overcast, the night at last became dark. We officers had now left the conning tower and took our stations on the bridge. The commander joined us. He shook my hand heartily and said: "That was well done." These words meant a great deal to me, as has every mark of recognition which I have later received. As it was beginning to grow cool, he ordered a bottle of port. The glasses were filled, and we officers drank to the day. I sent my man below

decks to my room to see how things were down there and to bring me another cloak. Hänel came back with the cloak and reported with a beaming face: "The Herr Captain's room is the only whole one left. All the others are completely destroyed." In looking at his smiling countenance I could but think of the old lines:

> Oh, St. Florian!
> Protect my house and let the others burn!

As we were the next to the last ship in the long line, it was to be expected that we would escape attack by the torpedo boats, which must always direct their attacks at the vessels heading the line. As a matter of fact only one English destroyer found the way to us during the entire night. All the other destroyers were driven off by the vessels ahead of us. I can not tell very much about these night engagements, as we were too far away. Firing was kept up, however, during the entire night. One must admit that the English torpedo boats attacked us over and over again with marvelous spirit. But they accomplished practically nothing. The only German ship that was sunk during the night was the small cruiser *Frauenlob*, and she was not sunk by torpedo boats but by an English cruiser which had overcome her in a gunnery duel and then sent a torpedo into her side. Not until dawn did the English torpedoes meet with any success. An English destroyer succeeded in hitting and destroying the *Pommern* with torpedo fire at long range.

From our position we were able to quietly watch the battle as it was fought out, at times at a great distance from us. Searchlights flashed, illuminating torpedo boats as they advanced at maximum speed. Both ships and torpedo boats used their guns: the huge splashes were lighted up and the thick clouds of smoke rolled past the ships and boats. All details escaped us. Nevertheless, the outcome of the battle was plain to us, when one burning, glowing vessel after another drove past us. I could but think of the living torches which the Romans in their gruesome orgies had running about while burning, for their entertainment. All iron parts were red hot. The boats looked like particularly fine golden red filagree work. The reason why the fire spread so rapidly over the English boats was that they were fitted for oil firing only. The oil ignited by the gunfire spread quickly over all parts of the deeply rolling vessels. It seemed as if at least 10 boats and ships drove past us in this condition. We looked at them with mingled feelings, for we were not absolutely certain that some of them might not be German boats. As a matter of fact, however, no German boat was destroyed that night. Our boats were cruising in search of the enemy fleet. It is a strange and almost incredible thing that our boats spent the night searching for the English main body and did not find it, although its point of departure was correctly known.

When the firing forward became somewhat quieter I heard, as I stood beside the commander, the noise of a turbine torpedo boat approaching at high speed. It was on the starboard side, and suddenly a black object emerged at about 4 points to starboard. Shall we light our single searchlight and thereby betray our presence, or shall we wait until the destroyer covers us with his searchlight in order to determine our position before firing his shot? I hastily advised the commander not to use our searchlight. He agreed with me, and the destroyer rushed past us. He was quite near, only 300 or 400 meters away, but he did not use his lights and fired neither gun nor torpedo. The ship following us, the *Von der Tann*, did exactly as we did. As the gunnery officer told me later, they also feared that the flash of their searchlights would bring the whole swarm of torpedo boats down upon them. Had they not seen us on board the English destroyer? Had he fired all his torpedoes? Had he already been under such telling fire that now he thought of nothing but to get away? I do not know. "Ships that pass in the night."

Thus the night wore away and morning dawned. At 2.15 a. m. a burning ship drifted past us; probably the English armored cruiser *Black Prince*. The entire ship was aglow. It must have been sometime since anyone remained alive on board. At 3.10 a. m. we heard two great detonations to port, but we could not discover what had taken place. We had to stop many times because the entire line ahead of us got into disorder, owing to the numerous torpedo boat attacks. Vessels in turning out to avoid the attacks and in advancing against the enemy boats, left their line, described circles, and then had to push into the line again wherever they could. Thus it was that the *Nassau*, which originally had been the second ship of the entire line, gradually became the last ship in the line, and therefore immediately ahead of us. It was no easy task for our navigating officer and the watch officer to keep the ship always at the right distance from the line so that we should not lose our place in the darkness.

At the first appearance of dawn we believed with certainty that we were about to enter battle once more with the entire English fleet. All preparations were made for the day's encounter. The direction indicators of the Bertha turret were again put in order by Heinzelmänchen and his faithful helpers.

We then assembled on the bridge and gazed into the night and into the creeping dawn. The torpedo attacks seemed to have ceased. Suddenly—it was about 3.50 a. m.—we heard a loud detonation, and an enormous shaft of fire arose before our eyes toward heaven. From the distance it looked like a giant sheaf of fire from a brilliant pyrotechnic display. We noticed that the two ships ahead of us were turning out with their rudders hard to port. What had happened.

ahead? What catastrophe had taken place? Our ship continued to cut the waves. We held our course, and so passed the place where the explosion had taken place. We looked all about us to see whether any men or pieces of wreckage were floating in the water. There was nothin to be seen. As we passed over the spot where the catastrophe occurred we could not form the slightest idea of what had happened, and yet only a few minutes before the *Pommern*, a battleship of 13,000 tons, had passed. An English torpedo boat had sneaked up to the very limit of visibility and torpedoed the *Pommern*. The ship must have been blown to atoms, as a few minutes later not the least trace of her was to be seen. My jolly friend and comrade, Lieut. Commander Elle, met a hero's death on board the *Pommern*. As gunnery officer he had always taken such pains to stow the ammunition so as to be safe from torpedo attack, and now it had all counted for nothing, for a torpedo must certainly have struck an ammunition room. We did not know until several days later that it was the *Pommern* which had been blown up.

At 4.10 a. m. the second squadron, which was preceding us, began to fire. We sounded the alarm "Clear ship for action," for we felt certain that a great decisive battle was at hand. But, as it turned out, it was only an English destroyer which had ventured too near and been fired upon. Perhaps it was the same one that had a short time previously torpedoed the *Pommern*. At any rate she got rough handling now. The destroyer, which was only a short distance from us, was set on fire before our eyes and became lost in the gruesome procession of living torches.

Meanwhile the sun had risen. On our ships hundreds of binoculars and telescopes searched the horizon, but nowhere was there any trace of the enemy. The fleet continued to the south, and in the afternoon of June 1 we entered Wilhelmshaven. Our ship was very badly damaged, and at many places everything had been converted into a mass of débris. The vital parts, however, had not been struck. The engines, boilers, steering arrangements, propeller shafts, and most of auxiliary machinery were practically intact, thanks to the heavy armor. The engine rooms had been filled for a long time with poisonous gases, but by using their gas masks the engine personnel—even though some of them were lost—had been able to carry on. The entire ship was strewn with thousands of fragments, large and small, resulting from the explosions. Among these fragments we found two 38-centimeter caps of projectiles which were almost undamaged; huge pieces in the form of large buckets, which later were used in the commander's cabin and in the officers' mess as champagne coolers, even though we could scarcely believe that they had been thrown on board by our English opponents for this purpose. The armor plate had been perforated in several places,

but the leaks had always been stopped up or we had been able to confine the inflowing water to small compartments. At Wilhelmshaven we buried our dead, almost 200 from the *Derfflinger*, who now rest in honor in the cemetery there.

On 4 June the Emperor inspected our ship and she was then docked at Kiel for a six months' overhauling. She was again ready for battle in December, 1916, after many repairs of various kinds, including her guns. The battle of the Skagerrak, however, proved to be the last meeting between our ship and the enemy, at least so long as the flag to which we had sworn our allegiance floated at her stern. This proud ship now rests in the Bay of Scapa Flow at the bottom of the sea.

CHAPTER XI.

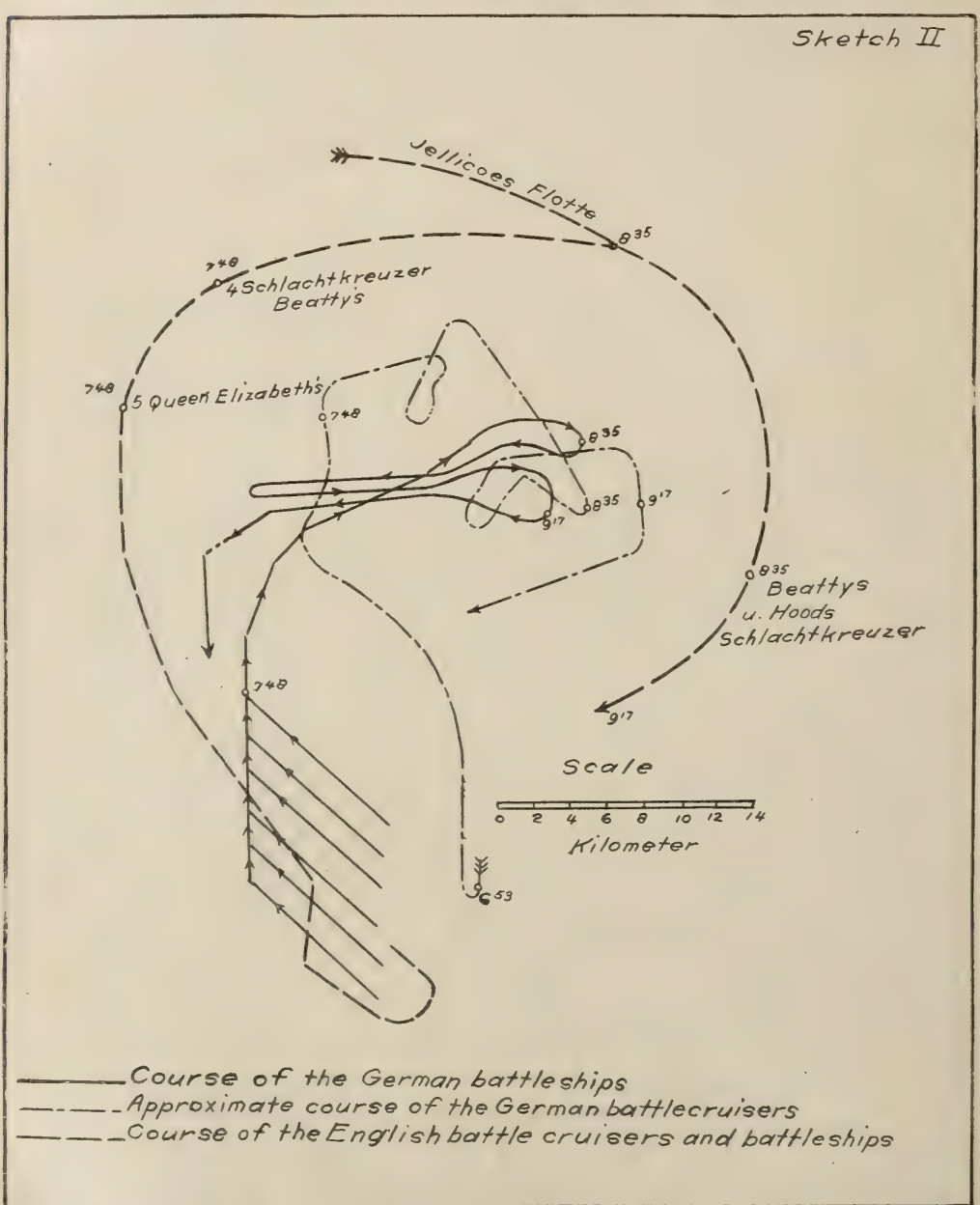
Observations on the Battle of the Skagerrak.

At sunrise on the morning of 1 June, the German fleet was standing off Horn Reef, at the same latitude, therefore, as the Danish city Esbjerg. When we discovered far and wide nothing of the enemy, I admit frankly that a load fell from my heart; for with our disabled ship, and especially with our crippled battery, we could have made but a poor showing against a dreadnaught with her guns intact. I had already fired almost all the ammunition for the Anna and Bertha turrets, and the rest of the ammunition in the Caesar and Dora turrets could not be utilized, as these turrets were still filled with poisonous gasses, and the ammunition rooms were flooded. I regretted from the bottom of my heart, for the sake of our fleet and the Fatherland, that the decisive battle was not fought then. This was undoubtedly a great grief and a disappointment for Admiral Scheer, our commander in chief. It would have been a very easy matter for the English to have offered us battle in the early morning. They had kept in touch with us during the whole night by means of their cruisers and torpedo boats. The English commander in chief was therefore kept constantly informed by radio concerning our every movement. It would have been a most fortunate thing for the Fatherland if an engagement had occurred at that time off Horn Reef, which was a comparatively short distance from Heligoland. To judge by what we saw on 31 May, many of the English ships must have been absolutely destroyed, and it must have required an enormous expenditure of ammunition to put the German dreadnaughts entirely out of action. If Jellicoe had sought a decision off Horn Reef on 1 June, the English Navy would doubtless have been forced to yield her place as the strongest navy of the world to America. I willingly admit that the complete destruction of Jellicoe's fleet on 1 June was not to be thought of; but, as one fully informed concerning our ships and of

naval armaments and also well informed concerning the English ships and their armaments, and on the basis of my experience in the battle of the Skagerrak, I think I can say with certainty that a naval engagement between the English and German dreadnaughts fought to an absolute decision, would have cost the enemy a very large number of his capital ships.

On 31 May it was not possible for Admiral Scheer, after his maneuver of withdrawal from the "lion's claws" to again deploy his fleet for battle in a manner that would be tactically favorable. A night engagement between two fleets of such power was an impossibility. In spite of all means of recognition provided for battle in the darkness, the action would have unavoidably been a cruel melee, a rending of ship by ship without a knowledge of whether it were friend or foe. But even if we, like "fearless gamblers" had endeavored to bring about a night battle, the English fleet must have avoided it. She would have lost in a night engagement all the advantages of her numerical superiority, her greater speed, and her long-range guns; everything would have been left to blind chance. Jellicoe did perfectly right in withdrawing at nightfall and in bestowing his squardon during the night in such a manner as not to be discovered by our torpedo boat flotillas systematically searching the locality where the battle had been fought. Jellicoe, furthermore, did perfectly right from the strategical point of view in not presenting himself for battle on 1 June. With the employment of the English fleet as a "fleet in being"—that is to say, by the mere fact of its existence—it had fully performed the duty thus far assigned to it. The battle of the Skagerrak did not for a moment interrupt the pressure exerted by it as a "fleet in being." If Jellicoe had not engaged in the battle of the Skagerrak on 31 May, and in order to keep his fleet undamaged had instead withdrawn to his port of sortie at Scapa Flow, we would have been able to carry out the task assigned to us by a commerce destroying warfare in the Skagerrak and the Kattegatt, and would thus have had control of the North Sea for a long time. The execution of our task, however, was frustrated by the battle of the Skagerrak. But as Jellicoe did not attack our fleet as it was steaming toward the German mine fields and home ports, he did not for a moment surrender the mastery of the sea. To what end then in this strategical game of chance should an additional move be made when his position was already such that the checkmate of the opponent could but be the result? Jellicoe withdrew to Scapa Flow. Later, when he made Beatty the chief of the fleet in his place and was made a lord by his King, he took the name of "Viscount of Scapa." Many a person in Germany and in England laughed at the idea that an admiral should take his name from a desolate spot where his fleet had lain continuously at anchor for almost four years. Nevertheless this

four years of idleness on the part of the English fleet contributed decisively to the fact that our entire navy was forcibly conducted to this same Scapa Flow and that it now lies at the bottom of the bay there. What a triumph for the "Viscount of Scapa." As the confidence of the English in victory was severely shaken after the battle of the Skagerrak, Churchill published a series of articles in the Octo-



ber number of the London Magazine on the war by land and sea. What he says in these articles concerning the war at sea and the battle of the Skagerrak is in my opinion not correct. More's the pity. We could but draw the following conclusions at that time: The English fleet presented itself for battle outside our mine fields and at a respectful distance from our submarine bases and coast defenses. We, however, were forced to seek battle if only to make an attempt to free ourselves from the iron clutch with which England

was strangling us. Hence we were compelled to seek the English fleet out on its own coast and engage it there.

In opposition to this, it has been said that the submarine warfare could only be carried out with an intact, high-sea fleet; that our naval harbors would have been hopelessly blocked if we had lost our fleet. The answer to this is that, in the first place, a battle with the enemy fleet was not equivalent beforehand to the loss of our entire fleet. The Skagerrak could be cited as proof of this. In the second place, the cruisers, old battleships, and torpedo boats, together with our submarines, mine layers, mine sweepers, airships, flying machines, and coast defenses, that would have been left to us in any case, would have sufficed for the prosecution of the submarine warfare. Furthermore, we still had the Kattegatt as a port of sortie for our U-boats. The submarine warfare had been conducted in Flanders without the fleet, under much more difficult conditions than those in the North Sea. A decisive battle on the high seas would indeed have made the submarine warfare unnecessary, and would have brought the war to a speedy end.

I do not want to detract from our joy at our partial victory over the English fleet at the Skagerrak by these reflections, but it turned out that this victory—like all of our others on land and sea—did not constitute a final victory for the German people. That it was like a chalybeate bath for the fleet and gave the German people new strength and confidence, contributing greatly to their prestige, there can be no question. It was a bad day for England as we sent 10,000 English seamen, together with the proudest of the English ships, to the bottom of the sea, while scarcely more than 2,000 German sailors had to yield up their lives for their victorious flag.

The extracts from Churchill's articles in the London Magazine (autumn, 1916) were published in a special edition of the Fremden Presse, of the News Bureau of the Imperial Navy Office.

I bring my narrative of the greatest day at sea which we Germans have ever experienced to a close with the wish that my little book and Churchill's article may be the means of enlightening many Germans as to the enormous influence the control of the sea has exerted on the history of the world, and will continue to exert for all time to come. And I express the hope that in coming years many Germans, proud of being Germans and sailors, will let the sea wind whistle in their nostrils.

It is true that we have been a poor nation. It is true that we have been greatly humiliated in our national honor. But because of that we will permit no one to take from us the courage for new deeds. Let us bear in mind the maxim:

Money lost—nothing lost!
Honor lost—much lost!
Courage lost—all lost!

H. M. S. "HOOD," SEARCHLIGHTS OF.

Source: Reliable. (9410) **May 11, 1920.**

Upon returning from Rosyth last week I drew as my companion in the sleeping compartment a civilian who had been at Rosyth to test the searchlights and searchlight installations of H. M. S. *Hood*, which vessel was then in dock at Rosyth. He stated that the tests conducted were entirely satisfactory and it was his opinion that the searchlights on the *Hood* were superior to the searchlights taken from various ex-German capital ships. He had personally inspected a number of German searchlights, and the information obtained from him confirmed the idea that many of the searchlights on ex-German ships at Scapa Flow had been removed prior to being turned over to other nations. (There are no searchlights on any of the five ships allocated to the United States.)

There are eight 36-inch searchlights on the *Hood* and two 24-inch signaling searchlights. Their location is as follows:

(*a*) Two 36-inch searchlights on the forward mast about 92 feet from the water line.

(*b*) Two 24-inch searchlights just abaft the director towers about 63 feet from the water line.

(*c*) Four 36-inch searchlights on a raised platform between smokestacks about 66 feet from the water line.

(*d*) Two 36-inch searchlights on a raised platform just abaft the after mast about 62 feet from the water line.

There are six control positions for the eight 36-inch searchlights. Each of the control positions is capable of single control, dual control, or multiple control; in other words, each distantly controlled station is capable of operating one or more, up to eight, of the eight searchlights.

The question of capital ship policy with regard to searchlights was touched upon, and it appears that the question of the proper number of searchlights for a capital ship is still debatable. There is one school which prefers a very material reducing of the number of searchlights on capital ships, trusting to star shells for the work usually done by searchlights. There is another school which still strongly believes in a large number of searchlights despite the use of star shells. No absolute policy is in effect at the present time, but the tendency is to reduce the number of searchlights on men-of-war.

My informant stated that it was the present policy of the Admiralty not to use searchlights in picking up a target and only to turn on searchlights a few seconds before the first salvo was to be fired; in other words, turning on searchlights should be followed in two or three seconds by the first salvo from the battery.

REPORT ON BARR & STROUD RANGE FINDERS.

Source: Reliable. **May 6, 1920.**

(13092)

A further conversation was had with Mr. Morrison, the London sales agent of the Barr & Stroud Co., and with a technical representative of the company. It was about the 30-foot naval range finders with the vacuum attachment which was the subject of a very recent report.

It would appear that Mr. Morrison's former statement that the Japanese range finders were actually to be supplied with the vacuum attachment was in error. He is connected with the sales end of the business and is not entirely familiar with all details. Discovering that he was in error he took the trouble to straighten it out. It appears that the Barr & Stroud Co. thought that they had the vacuum device perfected. Mr. French, of the Barr & Stroud Co., who gave us the original information at the time of the test, nearly three years ago, at that time said that taking out part of the air would remove most of the difficulty. The intention was to take out such air as they could on the present range finders with the idea that the removal of some air would at least be better than leaving it all in, and that greater perfection could follow. It appears, however, that recently trouble has developed, due to the fact that air leaks in at a rather rapid rate. It is not so much a question of leaks in the joints as it is that the whole composition tube and various other parts of the castings are more or less porous, and the air comes in actually through the metal itself.

When this is the case there are currents of air inside. Even with a vacuum approaching 20 inches, Prof. Barr finds that the effect through leakage causing currents of air is worse than no reduction in atmospheric pressure at all, where the air distributes itself according to its varying density. In other words, they have been compelled to drop the idea for the time being until they can develop an entirely different kind of tube (probably of steel) or obtain in some other way a very high vacuum that would remain constant.

Mr. Morrison said that by about December they would be prepared to manufacture a proper vacuum range finder. He said that his previous statement about the F. X. type in the British service and under manufacture to the Japanese having this feature was in error, as they had decided that these particular instruments could not have the air exhausted and that they would have to wait awhile until the difficulties of leakage through porous metal were successfully overcome.

He was interested in the possibilities of sales to the United States, or a finishing up and completion in the United States of range-finder parts supplied through an American company. He said that they were hard hit for capital and probably could not organize in the United States, and, anyway, would prefer to do the manufacturing in England.

He was thoroughly familiar with our legislation, which prevents large orders for munitions being placed outside of the country, but he though that at some future time they would like to build us a good vacuum range finder of 30 to 40 foot base to prove that their construction was better than any other.

KAWASAKI DOCKYARD, KOBE, 9 MARCH, 1920.

Source: Reliable. **April 29, 1920.**

(5969)

On 15 October there were four submarines in the water at this yard. Two of these have been finished, tried out, and left the port about 1 January 1920. On March 1 the remaining two began their trial trips.

The keel of one destroyer was laid about 10 February (about 1,050 tons displacement).

The four submarines had each three elliptical openings in bottom, one forward and two just abaft screws. Apparently these were for mine laying. Each boat mounts a 3-inch gun forward of conning tower; they each have two 6-cylinder Diesel engines of about 10-inch bore.

Kawasaki has a stone dry dock with capacity for a ship of 15,000 tons dead-weight.

There is an enormous machine shop, modern and up to date.

The boiler shop is particularly fine in its equipment.

This yard builds Scotch water-tube boilers. It builds ships, engines, boilers, and all equipment.

This yard built a 9,100-ton dead-weight cargo ship in 27 days—keel laying to trial trip.

There is an experimental department, where motors for aeroplanes are being manufactured; also motor trucks for the Japanese Army (3, 4, and 5 tons). At present there are on the building ways four Kawasaki standard 9,100-ton dead-weight cargo carriers, two tankers (for imperial navy) each 10,000 tons dead-weight, and one light cruiser of 5,500 tons. This yard builds locomotives complete. Character of work fair on commercial orders; very good on Government work. Their stock ships all burn coal. This company has 20 ships on charter.

There are building at this yard 8-cylinder Diesel engines of about 600 horsepower. Three sets in shop in various stages of completion. One engine on test blocks.

The personnel of the office is made up of high-class type of men, university graduates and men educated abroad. There is, throughout these works, a very fine spirit of loyalty and pride. Everybody strives successfully to maintain a very high standard of workmanship. About 10,000 men are employed and work nine hours a day, 6.30 to 4.30.

Destroyers.

Two in the water before 15 October 1919. Both 800-ton boats, 30,000 horsepower each.

Both made a little more than 35 knots on trial trip. High forecastle. Yarrow boilers (Japanese Admiralty type), four in each boat. Three burn oil only, and one burns coal and oil. Engines and boilers built in yard.

Light Cruiser.

Keel laid about 1 January 1920; 5,500 tons.

Tankers.

For Imperial Japanese Navy. Two more to follow this one. One nearly completed. Keel laid about 15 December 1919. To be launched about last of April. Will carry about 10,000 tons deadweight; built to carry gasoline.

A STATEMENT CONCERNING THE JAPANESE NAVY.

Source: Reliable.

(11623)

May 14, 1920.

A statement was made by a British naval officer who has seen considerable service in Japan as follows:

When asked "How good is the Japanese Navy," he answered "The second best in the world; it ranks next to the British Navy."

Having been associated with the Japanese Navy, he is certainly qualified to compare his own and the Japanese navies.

In giving Japanese the second place he must place her before the United States Navy because of the shortage of men and the resignation of officers in that service. He likes the Japanese naval officers very much and admires their absorption in and devotion to their profession.

The Japanese naval officers may belong to the Naval Club, but they join no other. They give all their strength and interest to the service. On shore they are in the office from 8 a. m. to 5 or 6 p. m. Afloat they stay by the ship practically all the time.

The enlisted personnel is very well handled—better than in the Japanese Army. I have reason to believe that the men in the Army are overinstructed, overworked, and overtrained. In the Navy, the life is much less rigorous, and better results are obtained. The Japanese sailor is very neat and clean and uncommonly well turned out. His leggins are well laced, his shoes polished, his cap ribbon well sewed on, his uniform fits well and is worn smartly—he looks and carries himself as a man-of-warsman should. Admiral Gleaves was much impressed by their smart appearance.

The officers and men in the Japanese Navy do not go in for outdoor sports and do not play cards. They study and work nearly all the time. They have no amusements and give all their time to the service. They devote no time to the pursuit of pleasures.

FURTHER NOTES ON KURE NAVAL STATION.

Source: Reliable.

(6799)

May 30, 1920.

The Kure Naval Station, on the Inland Sea, is a very complete plant.

The engines and boilers for the new 33,000-ton battleship (*Nagato*) were built there, as well as the ship herself.

Her armor and her guns, including the large-caliber guns, were built there also.

Her armor is not believed to be as good as that made in England, Germany, France, and the United States. (While the naval officer in charge of the manufacture of the armor was three years at the Creusot Works in France, and is an able, ambitious man, his experience is not a very lengthy one, and his assistants and workmen and his material are not as good as they might be.) Tools are good.

While the 16-inch guns seem very well made, it remains to be seen how well they will stand up under service firing.

Immediately upon the launching of the *Nagato* the lengthening of the building dock was commenced, all the plans having been made previously. It will take 6 to 12 months to complete this work preparatory to the laying down of a 40,000-ton ship.

The Kure station claims to be able and actually engaged in building everything needed by a first-class navy except the gyro compass, which they admit buying from abroad.

They manufacture the head and tail and engines and gyroscope of the 21-inch torpedo, but they have not yet actually succeeded in making the air flask, although they exhibit partially completed flasks and claim to be making them.

This station is reported to produce about 1,000 tons of high-speed tool steel annually. Also produces about 200 tons per month of boiler steel for sale to private shipyards.

A good deal of the machinery at the station is old and out of date—perhaps 40 per cent of the machinery plant. But steps are being taken to replace the old machines by the latest types at the earliest possible moment.

Submarine engines of about 750 horsepower are being assembled at this station, apparently imported from Switzerland.

At Kure is space, under cover, for setting up four turrets for 16-inch guns. This space was used for the *Nagato's* turrets.

It seems probable that the turrets for the *Mutsu* were set up at Muroran (in Hokkaido), where some of her 16-inch guns were built.

One three-barreled tube for 21-inch torpedoes (with mount complete) was seen at Kure, where it was manufactured.

A new experimental 6-inch mount was exhibited with pride, that provided for hand elevating and firing and foot training by the No. 1 pointer.

There have been labor troubles at Kure (as everywhere else in the Empire), but nothing serious up to this time has happened.

BATTLE DEATHS IN THE ARMY DURING THE WORLD WAR.

Tables are based on the latest revision of figures and supersede the figures published in Weekly Statistical Report No. 115. Officers and men who entered the service after November 11, 1918, are not included.

	Number who served.	Per cent of total Army.
Regular Army officers	11,358	0.3
Emergency officers	193,772	4.7
Total officers	[1] 205,130	5
Enlisted men	[1] 3,897,194	95
Total Army	4,102,324	.....

BATTLE DEATHS.

	Number.	Battle deaths per 1,000 who served.
Regular Army officers	155	13.6
Emergency officers	1,976	10.2
Total officers	2,131	10.4
Enlisted men	45,598	11.7
Total Army	47,729	11.6

TOTAL OFFICERS WHO SERVED.

	Number.	Per cent of total.
Regular Army	11,358	5.5
Emergency	193,772	94.5
Total	205,130	.....

[1] Includes those who served first as enlisted men and later as officers. The number of these, although at present undetermined, is estimated at about 60,000.

BATTLE DEATHS AMONG OFFICERS.

	Number.	Per cent of total.
Regular Army	155	7.3
Emergency	1,976	92.7
Total	2,131	.....

GRADUATES OF UNITED STATES MILITARY ACADEMY—NUMBER WHO SERVED AND BATTLE DEATHS.

	Graduates of United States Military Academy.	Total.	United States Military Academy in per cent of total.
Officers	3,081	205,130	1.50
Battle deaths	33	2,131	1.55

ESTIMATED STRENGTH OF THE ARMY, JUNE 10, 1920.

Source: The Adjutant General's Office and Transportation Service.

	Officers.	Men.	Total.
United States	13,656	150,822	164,478
Philippines [1]	667	20,102	20,769
Germany [2]	673	15,810	16,483
Panama	223	4,738	4,961
Hawaii	226	4,715	4,941
Porto Rico	49	1,454	1,503
China	65	1,278	1,343
Alaska	21	854	875
France	118	13	131
England	10	7	17
Siberia	3	2	5
At sea:			
En route United States	16	438	454
En route Philippines	8	318	326
En route Hawaii	10	147	157
En route Europe	9	20	29
Total	15,754	200,718	216,472

COMMISSIONED STRENGTH JUNE 10, 1920.

Officers.	Number.	Per cent of total.
Regular Army	8,128	52
Emergency, on duty	7,133	45
Emergency, undergoing physical reconstruction	493	3
Total	15,754	.....

[1] Includes Philippine Scouts, 222 officers and 7,082 enlisted men.
[2] Includes all troops under jurisdiction of commanding general, American forces in Germany.

RECORD OF PROGRESS OF SHIPBUILDING IN JAPAN.

Source: Reliable.

May 14, 1920.

(6004.)

The result of the latest statistical investigation published by the department of agriculture and commerce indicates that of all the industries in Japan shipbuilding has made the greatest progress during the war.

Before the war Japan ranked sixth among the powers in the vessels built, as shown in the following table:

	Number of vessels (1913).	Tonnage (1913).
Great Britain	779	1,980,492
Germany	162	465,226
United States	205	275,448
France	89	176,095
Holland	95	104,296
Japan	94	77,609
Austria	17	61,757
Italy	38	50,356

Since the outbreak of the war, however, the shipbuilding industry in Japan has made a remarkable development, as the following figures for 1919 indicate:

	Tons.
United States	4,075,000
Great Britain	1,978,000
Japan	620,000
Holland	137,000
Italy	83,000
Norway	57,000
Switzerland	52,000
Sweden	51,000

It may further be noted with interest that the gross capital of the Japanese shipbuilding companies with a capacity of constructing vessels above 1,000 tons aggregated yen 200,000,000 in 1919, and their production during the same year amounted to yen 450,000,000.

INFORMATION ON MITSUBISHI SHIPYARD, NAGASAKI.

Source: Reliable.

April 29, 1920.

(12140.)

In 1884 the Mitsubishi Co. took over an insignificant shipbuilding yard at Nagasaki, buying it from the Government. It has developed into the finest yard in Japan, contributing most largely to the shipbuilding industry of the Empire.

This yard occupies a tract of land on the western coast of Nagasaki Harbor. It is thoroughly equipped with the most up-to-date shipbuilding machinery and appliances. Its facilities include three dry docks (granite) and one slip. The dry docks are 350, 510, and 714 feet long, respectively, the depths of water on blocks at ordinary spring tide being 24, 26½, and 34½ feet, respectively. The slip is capable of lifting vessels up to 1,000 tons gross.

The yard employs 15,000 workmen, including apprentices and some 300 women.

Its building capacity is 80,000 tons, with 100,000 horsepower.

During 30 years the yard has built about 50 vessels of 1,000 tons or more each. These include the battleship *Hyuga*, 31,260, the battle cruiser *Kirishima*, 27,500 tons, and the merchant steamers *Tenyo* and *Chio*. The yard does repair work on from 200 to 500 ships a year.

In 1917 a factory was started in Morimachi, Nagasaki, for making torpedoes and other naval implements. The factory was completed in early 1919. It employs 400 men.

The organization and plant and character of work of this yard are all excellent. The yard enjoys the greatest reputation in Japan and has the best record of all the yards.

There is a branch yard employing 6,000 men at Kobe, and another, established in 1914, at Hikoshima, on Shimonoeeki Strait, as a repair plant, employing about 500 men.

HARIMA SHIPYARD.

Source: Reliable.

April 29, 1920.

(13160)

This is a repair yard situated at Harima, on the Inland Sea.

It is situated on an island, with excellent water up to the sea wall, and is possessed of a very fine roadstead and an excellent inner anchorage.

The yard is built on a narrow strip of land with abrupt hills rising behind it.

The hills are being dug away and blasted so that the yard may be extended.

This yard has four building slips and one dry dock.

The slips will accommodate craft up to 12,000 dead-weight tons.

The dry dock will hold a vessel up to 8,000 dead-weight tons.

Most of the shops are old and in bad condition and contain poor machinery.

The machine shop, however, is new and modern and well equipped.

The big metal yard is well laid out and there is a great abundance of shipbuilding material in it.

The yard has its own electric power plant and slip for unloading metal and coal.

A 6,875 dead-weight ton cargo boat, for the United States Shipping Board, is completing at this yard now.

THE JAPANESE WAR PLANS.

Source: Reliable.

April 29, 1920.

(13147)

Mines.

The Japanese war plan contemplates the use of mines to close the Ryukyu Channel (between Kiushiu and Formosa), the Formosa Straits (between Formosa and the China coast), the Tsugaru Straits (between Hondo and Hokkaido), the Soya Strait (between Hokkaido and Saghalien), and the Mamiya Strait (between Saghalien and Siberia). The entrances to the Inland Sea are to be heavily mined.

Guns.

Guns are now being mounted on the Ryukyu Islands.

The Hakodate defenses are to be provided with new 16-inch guns which will, with mines, close the Tsugaru Straits. Two new 12-inch guns have just been mounted on one of the islands at the entrance to Tokyo Bay.

Fleet.

To be based on Kure (Inland Sea) and cover the southeast coast from Tokyo to Bungo Straits.

LAUNCHING OF DESTROYER "TOGA."

Source: Reliable.

April 29, 1920.

The destroyer *Toga*, which has been building at the Ishikawajima Shipyard, Tokyo, was launched April 17, 1920, at 4 p. m.

Her dimensions are as follows:

Length	275 feet 5 inches.
Beam	26 feet 0 inches.
Draft	8 feet 6 inches.
Displacement	850 tons.
Speed	31.5 knots.
Number of boats	4.
Complement	110.
Armament	3 4.7-inch; 3 double-barreled tubes, 21-inch.

THE BATTLE CRUISER "AKAGI."

Source: Reliable.

May 14, 1920.

(11966)

The material for the 40,000-ton battle cruiser *Akagi* has been secured and collected at Kure, but on account of the fact that the dock at Kure has not yet been expanded and the navy is very anxious to begin construction, a novel scheme has been hit upon to expedite her building.

The keel will be laid for the stern first and they will work forward. Construction will begin on enlarging the dock at the same time, and by the time the extension on the dock becomes necessary for the building of the forward part of the ship they hope to have it finished.

At present Kure is busy on the construction of mine layers.

JAPANESE EMIGRANTS.

Source: Reliable.

May 14, 1920.

(7440A)

According to an article in the Japan Times of April 28, the following emigration statistics show Japanese emigration to the foreign countries during the year 1920:

To the United States, 2,377, of which number 1,093 were women.
To England, 518.
To Siberia and Russia, 178.
To Singapore, 132.
To Dutch East Indies, 131.
To India, 24.
To Philippines, 155.
To Brazil, 1,261.

INTERNATIONAL.

AMERICAN LOANS TO CHINA.

Source: Reliable.

April 6, 1920.

"In Peking the form and machinery of democratic government are maintained as an elaborate and expensive show for the benefit of the foreign powers which have diplomatic and financial dealings with China. There is a President, there is a cabinet, and there are nine elaborately organized ministries with thousands of employees. Two or three constitutions have been written, each designed to serve the immediate interests of those who supervised their making, and for some years many scholars have been employed in the compilation of civil and criminal legal codes.

"The Chinese have a strong dramatic instinct, and those whose business it is to run this governmental machinery play their parts so well and with such seriousness that a resident of Peking who has no opportunity to travel in China falls under the spell of these consummate actors and frequently commits the absurdity of taking the Chinese Government seriously. One has to travel in China and know something of Chinese life to get away from this obsession and to understand how very little the Chinese Government means to the Chinese people, how little the people and the Government have in common, and how far from being a democracy China really is.

"It is no exaggeration to say that if Peking were swallowed up to-morrow by a flood or an earthquake, if every branch of the Government and every factor in it were to disappear entirely, it would not affect in the slightest degree the daily routine of the great masses of the people. This is very largely due to the fact that there is no articulate public opinion in China.

"Under the Empire the Chinese people had no more occasion to think of public affairs than little children have to concern themselves with the management of their father's household. The newspapers in China do not reach a thousandth part of the population, schools are inadequate, a very big proportion of the people are illiterate, the postal system is good, but is not over patronized, the telegraphs are used only by officials and wealthy merchants, there are only 6,000 miles of railway in a country of 400,000,000 square miles; what happens to-day in Peking is ancient history to the masses of the people in

the interior by the time it is known to them. If any act is iniquitous, the knowledge of it comes too late for any attempt at reform. Where there is no public knowledge of current events there can be no public opinion, and in a country in which there is no public opinion it is absurd to look for officials responsible to public will.

"Under existing conditions a democratic government, representative of the will of the Chinese people, is wholly impossible, and it is unfair to look for it. Under the old imperial system all officials, both civil and military, were responsible to the Emperor. Tradition gave the person of the Emperor a sanctity and prestige which overawed even the highest officials, and which put a most decided check upon their ambitions and upon their conduct of public affairs. Under the so-called republic, these same official classes, which never were responsible to the people, have had no tangible head to call them to account and have therefore been responsible to no one but the men who by virtue of superior prestige in the army could command greater military power.

"Under the old régime the military folk were rated far below the civil officials, and the imperial will kept them in this position. In the irresponsible struggle for power, position, and wealth which succeeded the revolution and which has been the essence of all so-called Chinese politics since the death of Yuan Shih-kai, the military people have naturally come to the fore, and all political discussions now are in terms of military strength.

"China is at present ruled by cliques of military leaders under whom the various civil officials are nothing more than clerks and financial agents. Every Province is governed by a military governor who regards the troops under him as his personal retainers, who strains every effort to build up his military strength, so that he can hold his own among his colleagues and speak with the voice of authority in the councils of the great military leaders of the nation. The real government in Peking is a group of military leaders, acknowledging at least nominal allegiance to the ex premier, Marshal Tuan Chi-jui.

"The struggle has been going on for many years between those military commanders and military governors of the Provinces who find it convenient to acknowledge Marshal Tuan and those who do not. The northern military group is usually spoken of as the Peiyang Military Party. Within this there are numerous subcliques and subdivisions, some of them powerful enough to oppose at times the will of the central organization in Peking and each hoping that it will some day be powerful enough to overthrow the leaders in the capital and assume the military dictatorship of the nation. No real loyalty or good faith binds any one of these military barons to another or to Marshal Tuan, and no one of them is in any degree interested in the

welfare of the people, since the people have never made any vigorous attempt to show an interest in their own welfare or to put a check upon the ambitions of their military overlords.

"It is certainly not to the interest of any of these generals to foster democratic institutions. They are all very much afraid of the growth of public opinion and of the development of public organizations which may at some time bring pressure to bear upon them and put a check upon their independent schemes. Their whole reliance is placed in their troops, and for the maintenance of their troops and the satisfaction of the politicians and civil officials who are their dependents and satellites, they require large sums of money, much larger than would be needed to run a thoroughly efficient government that would satisfy all of China's actual needs.

"Secure in their irresponsibility, the military leaders in Peking have never hesitated to pledge public securities, public liberties, or to grant privileges which seriously compromise the independence of the nation in exchange for foreign loans.

"This has suited Japan's purposes, since a control of China's resources, and incidentally of the Chinese Army, is essential to Japan's strategic position in the Far East, and Japan has therefore liberally financed the Peiyang military group and has negotiated many loans which have no other sanction in China than the will of the military dictators. With the money secured from Japan, China has been kept in a state of turmoil for four years, which has seriously retarded commerce, impoverished the people of many Provinces, and has made impossible the development of democratic institutions and the development of communications and education, which are so essential to the growth of democracy in this country. This suits Japan's purpose perfectly. It also suits the purpose of the militarists in China, so an effective alliance has been formed between the northern militarists and the Japanese Government against the Chinese people and against all other foreign powers which have interests, or hope to develop interests in China.

"It is this military federation which maintains the make-believe Government in Peking, which by force of circumstances the legations of the occidental powers are forced to recognize as the Government of China.

"Every serious student of Far Eastern affairs believes that the interests of the occidental peoples in China and in the Pacific are bound up with the interests of the Chinese people. Creation of a responsible democratic government in China would solve most of the problems of the Far East, while the creation of such a Government in Japan would automatically solve all of them. It should be the policy of America especially to make clear in every diplomatic act and in every business transaction in the Far East our community of

interest with the people of China and our disapproval of the shabby militarism which hampers the growth of democracy and deliberately suppresses all expressions of public opinion.

"If this policy were established by all the occidental powers, and strictly interpreted and rigidly enforced, it would not only win the approbation of the Chinese people but would very quickly cripple the bogus militarism which now rules China. It is not easy to establish such a policy, however, and it is very difficult to enforce strict adherence to it.

"Last March the legation in Peking agreed to lend no more money to China and to import no more arms into this country until peace had been established. Evasions and violations of this agreement have been so frequent during the past year that it carries no further weight. Under the existing conditions, it is impossible to develop a mine, establish an industry, or build a railway without contributing materially to the exchequer of one military group or another.

"In the Provinces the military governor is a stockholder in every business venture established with native capital, and the Japanese have established such a precedent that it is impossible for foreigners to do business without sharing in some way with the local military dictator.

"Every service done such a person we know perfectly well is an injury done the Chinese people, and is a material setback to the development of free institutions in China. It is nevertheless very hard for the diplomatic representatives of any government to refuse sanction and protection to every business venture launched by their nationals, which involves the disagreeable features of a bonus to the military governor in one form or another.

"The impunity with which Japanese merchants and financiers carry on business which is detrimental to China's best interests makes the merchants of other nationalities very restive under the restrictions of their legations.

"The Italian Government permits its subjects to smuggle arms and ammunition into China, knowing perfectly well that these go to equip the forces of bandit barons who are not only the worst enemies of the Chinese people but of foreign interests in China as well; the British permit their subjects to sell great numbers of expensive aeroplanes to the Chinese, knowing that they will be put to no useful purpose in China, and that they are simply purchased to give a few minor militarists commissions and to give them the benefits from the loans advanced at the time of purchase; American firms to-day would gladly sell arms and munitions to the Chinese if the sanction of the American Legation could be obtained.

"In the independent southern Provinces the conditions are not materially different. These Provinces are also ruled by cliques of military who are fighting for their own personal advancement, and

whose strength does not rest upon popular approval but upon the hordes of armed coolies which they contrive to maintain, all of which is ruinous to the Chinese people. Their championing of parliamentary government, of constitutionalism, and the like is a pretense and is not taken seriously by any one in China.

"The peace conference in Shanghai is the most hopeless farce of all. Instead of representing two distinct sides, the delegates represent many different military factions, each representative intent upon securing everything possible for his immediate military overlord. The delegates from Szechuan, Kweichow, and Yunnan represent Military Governor Tang Chi-yao and his cliques; the Kuangsi delegate represents Gen. Lu Yung-ting and his friends; the Kwantung delegate represents Gen. Mo.

"If the conference at large agreed to anything that was not satisfactory to each and all of the military potentates represented, their decisions would promptly be rejected by the provincial leaders, who, considering themselves slighted, would carry on the feud. No agreement is expected or hoped for by the Chinese. This is just another show for the delectation of the foreigner.

"If peace and unity were really desired, a few delegates from the north could run about the southern Provinces and arrange for the equitable division of the spoils from a few loans from Japanese or other sources, and settle matters very quietly and simply. Any agreement that would be reached would simply be an agreement for the division of the spoils, and if this division did not later materialize there would promptly be further declarations of independence and new feuds.

"There can be no peace in China until the existing militaristic system is completely broken down and until sufficient public interest has been aroused in public affairs to put an effective check upon the official classes.

"There can be no development of mines or industries which will in any way benefit the Chinese people or be put upon an honest business basis satisfactory to occidentals until the military system has gone. In the past it has been the policy of those Chinese who considered themselves patriots, and of many foreigners interested in Chinese affairs, to break the power of the military organizations by playing one potentate against another. This is a fascinating game, but it is a game in which no foreign power is equipped to play a winning part but the Japanese. The only game which the rest of us can contemplate with any hope of success is that of playing the Chinese people against all the militarists, encouraging frankly every democratic movement and withholding all material support and sympathy from each and every military clique or individual military leader. This brings us to the question of loans.

"Assuming that what the occidental powers interested in China most desire is an efficient democratic government which could main-

tain internal peace, protect foreign investments, and guarantee equal commercial opportunity, it would be highly desirable to lend money to China in almost any quantity if the advancement of money under any conceivable conditions would materially assist in the creation of such a government.

"It is difficult, however, to think of any system under which money could be loaned to China so as to be of immediate benefit in the reformation of the administration which would not entail such elaborate conditions and such close supervision as to amount in effect to the government of China by a foreign commission.

"If the people of China can not be brought to understand the shortcomings of their present system of gross misgovernment and to control them within a reasonable time, the only alternative would seem to be government by an international commission, controlling not only the collection of revenues but the expenditure of funds as well. Such a system would have to be a huge and elaborate one to be at all effective, and would, of course, be very expensive, but it is the opinion of nearly every student of China's resources and finances that if the original investment were sufficiently large it would pay and would certainly serve to prepare the Chinese for intelligent and honest administrative purpose are out of the question. The proceeds from such loans would simply be misappropriated by the present unrepresentative rulers and the expense of proper supervision of expenditures be too great to make such advances other than acts of misplaced charity.

"Nothing would be so wholesome for the so-called Chinese Government as to force it to live upon its own resources. It has been estimated that if there were a decent government in China which would warrant the powers in abolishing extraterritoriality, the foreign trade would so increase that the customs revenue alone would pay China's foreign debt in five years. It is accurately estimated that if the land tax alone were properly collected and the proceeds accumulated in Peking, the revenues thus obtained would pay China's national debt in three years and at the same time cover the central Government's annual budget for the same period. The only loan for administrative purposes that could be of conceivable benefit to anyone concerned would be one so big that it would place all China's revenues under foreign control and give an international commission the right to supervise expenditures. This would imply an international government of China, nothing less.

"In this matter, as in all other discussions of loans, it must be remembered that a small loan, however carefully supervised, only releases funds from other sources. Suppose I lend the Government $5,000,000 to-day to pay off all the civil employees in the ministries in Peking or all the schoolmasters in China who have not been paid

for five months. This means that, however carefully I supervise the expenditure of this money, the next five millions from the customs surplus or the salt surplus goes into the hands of the militarists, who are now under no obligations to the civil employees of the Government or the schoolmasters, and enables them to raise and equip an extra division or so of coolies from the bandit districts. No small loan to the Chinese Government can serve any other purpose than that of putting 'velvet' in the hands of the classes of Chinese officials who are already fattening on misappropriations, and no big loan for administrative purposes can be of any service to China or to foreign trade which does not amount to taking the whole administration of China in pawn and to running the risk of antagonizing the entire Chinese people in the execution of the terms of the loan.

"There has been much talk of lending money to China for the disbandment of troops. This is a highly laudable purpose. It has been the fashion in the Far Eastern press for some years to refer to the Chinese Army as the 'soldier curse.' The Chinese Army is utterly useless for national defense, and as a police system in the interior of China it is such an utter failure that it is easy to prove that the more soldiers there are in any given district the more bandits there are, and the more beggars there are. The first interest of a representative Chinese Government would be the reduction of this force to a minimum. The first interest of the military barons who now rule China and maintain their respective jobs by displays of ragged, untrained ruffians in uniform is to keep up this display by hook or crook and to increase their followings or make their equipment more effective at every opportunity. The present Government will never accept any loan, great or small, for the disbandment of troops if it is insisted that such disbandment be made effective. The only way in which actual disbandment could be insured would be this: Put an embargo upon the import of arms so that no disbanded troops could be reequipped; insist that when the men are paid off no man should be recognized as a soldier who does not produce a rifle and a reasonable amount of ammunition; confiscate all such arms and ammunition and hold them in bond until the principal of the loan had been repaid. Under such conditions no loan for the disbandment of troops would ever be accepted.

"There is no commander in China who does not hope to increase his political power by increasing his military following. A loan which would rob him of any part of his following and net him no commission would be the most unwelcome thing he could contemplate. To make the disbandment condition to a loan effective would entail elaborate supervision. A foreigner would have to pay every soldier and see every rifle put under seal in a bonded warehouse. It is ridiculous to believe that there would be any real disbandment under any other system.

"The Government is ready enough to agree to unsupervised disbandment. The funds would be received and it would be announced in the official gazette that the third, seventh, tenth, and fifteenth divisions had been paid off and disbanded. A few days later it would be announced that Gens. Wu Pei-fu, Chang Chin-yao, Lu Yung-hsiang, and Liu Hsun had each been organized to meet the exigencies of the times in their various districts. By letting the present government believe that we, the occidental powers, actually take them seriously, we give them the courage to practice such deceptions upon us.

"In January the Chinese Government agreed to accept an advance from the consortium for the purpose of disbanding troops, but the vice minister of finance openly told his friends, foreign as well as Chinese, that the money would go to the various ministries in Peking to pay current expenses and that if the disbandment idea was anything more than an apology for the loan in foreign circles, it was not wanted. Better terms were to be had from the Japanese.

"Again the only terms upon which the various parties and factions could all be brought to agree would be a proportionate reduction all around. Li Shun of Kiangsu would rather lose his right hand than give up part of his army unless Lu Yung-hisiang on his east, Ni Shih-chung on his north, Chen Kuang-yuan on his west, and Mo Yung-hsin or Li Hou-chi or some other possible rival on his south, all sacrificed equivalent proportions of their troops.

"Disbandment would have to be spread out so thin that it would take as many foreign supervisors of disbandment as there would be corporals, squads disbanded. Under such circumstances the local commanders in each district would take delight in turning over to the appointed supervisors all the worn-out rifles and useless ammunition which were gathering mold in the local armory and it would be a simple matter to hire coolies at ten cents each to march up and present these trophies while the commander pocketed the funds and his forces remained intact. The only kind of a disbandment scheme that would really better the situation in China would be one in which the commanders were actually forced into paying off their men out of their own misappropriated revenues when the men threatened mutiny. This can be best effected by withholding loans and not by advancing them.

"If money could be withheld from the Government until the unpaid soldiery were really dangerous, it might be possible with a very big advance of funds, to effect a genuine disbandment of a great part of the army and to cripple the military barons to such an extent that reform in China would be possible. But such an advance would have to be preceded by a stringent embargo upon all money and military equipment and the expenditures would have to be supervised by a veritable army of competent foreigners. It is probable

that before the military commanders would agree to any such terms there would be a widespread revolt in the army which would solve the military problem without a loan.

"If the interests of the Chinese people coincide with our interests, if the best promise of security for future investments in China and for our Pacific trade is the promise of a workable Chinese democracy. then, if we are to invest money in China we can not invest it better than in making democracy possible through education. Communications are the greatest of all the educational mediums. Schools, newspapers and big business follow the railways. In a mining community the man who is quickest and surest with a gun has the law on his side—until the railway comes. With the railway comes order, decency and law. The most hopeful sign of a public awakening in China has been the so-called student movement, an intellectual insurrection against military feudalism in the treaty ports and the railway towns. It scared the militarists at first and checked them seriously until they had gauged it. They know its strength now.

"It is confined to the cities at which steamers call and the towns served by railways. These communities constitute a very small fraction of all China and though they do happen to be pretty much under the foreign eye and to get a lot of foreign advertising the great part of China is still safe for militarism. Every mile of railway built in China shortens the life of the present system of government at least a decade. Every school established—and nearly every school of any real value is in a treaty port or a railway town—loosens a brick in the foundations of the present system of misrule.

"Every newspaper—and there is no paper where there are not respectable communications, no matter how subsidized or how edited—is a menace to a scheme of government which is based upon the ignorance or indifference of the people governed. In short nothing is so essentail to China as good communications.

"The existing railways are not particularly well managed. They afford lordly opportunities for graft to whole hordes of employees and they are abused by every military commander who sees fit to send forth his uniformed coolies in one direction or another. But the amount of worldly wisdom which seeps into otherwise primitive communities through the mediums of the railways is amazing, and it is just as amazing to find how great a sense of responsibility and respect for public opinion takes possession of the officials who are stationed along the main lines of communication.

"The foreigner who wishes to invest money in China with the hope of some better return upon his money than his 7 per cent can do no better than build railways, build schools, endow scholarships, and make conditions such that illiteracy is shameful. If a man can build a new railway or open a new port, he is establishing a real

security for foreign investments. If he lends money to the Chinese Government for so-called administrative purposes or for make-believe disbandment of troops, he is postponing the day when we can withdraw our legation guards, abandon the safeguard of extra-territoriality, and treat China as a civilized nation.

"There is much talk of security for foreign loans and investments in China. The best security for such loans is to be found in a self-respecting, responsible Chinese Government. This has not yet come to exist in China. Under existing conditions it is a misnomer to call anything security which does not come within the range of the guns of foreign men-of-war.

"The customs revenues are a security because all the custom-houses in China can be commanded by foreign gunboats. The salt revenue is a security entirely dependent upon either the good will of the Chinese Government or the power of the nations concerned in the loan which this revenue guarantees to frighten the Government into cooperation and to frighten the people in the remote interior into paying. A loan secured by such an institution as the Salt Gabelle is founded upon nothing better than the good will of the Government to pay or the power of the lending parties to enforce collection and payment from the Government.

With the wine and tobacco tax, it is even more of a misnomer to call it a security. If the Government wishes to assist collection of these taxes under foreign supervision and if the Government has the power to assist in collection, all well and good; but if the Government refuses to assist or if the Government has not the authority in certain districts or provinces, then the tax as such ceases to be a security unless the lender is prepared to send an army into the countries less rural districts in which the tax is collected to enforce payment. It is not likely that any occidental government would ever resort to such tactics in the interest of its bankers.

"Any one of these pledged revenues which is not within gunboat range is worth just as much as and no more than the credit of the government unless the lender is prepared to make an invasion, and, finance a military occupation in lieu of holding the government responsible. It would be cheaper to encourage the establishment of a decent government in the first instant. And probably the only feasible way of encouraging decent government is to withhold all support, financial or otherwise, from every political organization, every enterprise, political or otherwise, which does not promise on the face of it to contribute to the betterment or enlightenment of the Chinese people."

DEALING WITH JAPANESE.

Source: Reliable.

In dealing with Japanese both in peace and war it is necessary to understand something of the origin of the undoubted differences between the occidental and the oriental point of view. Besides the inherited differences of race, there is a difference in point of view arising from the fact that the social and economic conditions of the Occident and Orient represent different periods of time and these differences are reflected in the outlook and standards of the respective peoples.

In the Orient economic conditions are those caused by predominance of manual labor and small industries. In the Occident economic conditions are those arising from greatly developed machine labor and corporate industries. In particular, Japan has only discarded a fuedal form of government within the memory of many men now living who took personal and even prominent parts in the old activities.

Therefore, the traditions and habits of the people as to social and ethical proprieties are such as the Occident outgrew some generations ago. We can come nearer to the oriental point of view by making ourselves acquainted with a good historical novel whose scene is laid three centuries or more ago and consider that Japanese regard things of to-day somewhat as our ancestors would do were they to revisit the world of to-day and act according to the customs of their own time, although this is far from the only difference between the Japanese point of view and our own.

The Japanese is most anxious to catch up with the times, but nevertheless he has been brought up under standards of every sort based upon class government. Class government is passing away in Japan as elsewhere, but in Japan the effect of class government is still a prevailing and dominant influence on the behavior of individuals and the customs of society.

As of interest to us in this matter, we must remember that a Japanese has little regard for one outside his class. Accordingly, he is aggressive and overbearing toward strangers and formal, conventional, and polite toward those of his own class.

In formal intercourse of Japanese officials with those of other nations we, therefore, find them very agreeable since, for the purposes of international intercourse, all belong to one class. At the same time the Japanese who has no formal and official relations with a foreigner is likely to be offensive, because he does not recognize any community of class and feels only a contempt for foreigners which is deliberately inculcated as promoting the fighting edge of the nation.

As a nation we Americans undoubtedly look down somewhat on the Japanese as our inferiors. It will help us in our dealings with them to bear in mind that on their part they by no means acknowledge such a superiority on our part.

On the contrary, they are informed and educated to believe that Japan and the Japanese are superior to all other nations and peoples.

Our officers and men going to Japan or liable to be brought in contact with Japanese should be made to realize the serious consequences likely to arise from failure to exercise politeness and forbearance in the face of little differences in intercourse.

To deal with Japanese to advantage it is therefore very desirable to observe the formalities, to pass the compliments, and to follow the conventions which were formerly the custom with us but which have been driven out of use by the telegraph, the telephone, and the express train, and the consequent hurry of life.

In this connection it should be remembered that among other formalities and compliments the interchange of complimentary letters of congratulation or condolence at every anniversary, accident, or good or bad fortune is highly appreciated by the Japanese and does much to elevate their opinion of our manners and customs from that of contempt to one of tolerance.

It should be impressed on all officers and men that the Japanese nation is accustomed to much show of courtesy, and all arrogance and curtness of behavior on our part serves merely to confirm them in the contempt for foreigners which they naturally hold. Formal politeness of liberty parties in spite of provocation of 'ricksha men and petty officials should never be laid aside or serious trouble may ensue. At the same time, while we should not fail to conform to their views of formalities due between acknowledged members of the same class, yet at bottom, the identity of class as toward foreigners is merely a fiction in Japanese minds and as strangers they believe we are entitled to no more equality of treatment than we can exact. Concessions without equivalents appear to them as weakness. Good nature and kindliness are scarcely appreciated, and bargains are open for revision in Japanese interest as soon as made. But the cruelty, arrogance, and lack of consideration which, upon occasion, they show toward foreigners is probably little different from what they would display toward their own people in case of riot, rebellion, or other conduct sharply separating a group from the majority of their fellow citizens and the sympathy of the governing classes.

Another point in Japanese etiquette most important for us to observe if we are to establish ourselves in their opinion as worthy of respect rather than as subjects of contempt is the retention of smiling calm in the face of untoward events.

The most offensive insult, an accident at table spilling the soup on one's shirt, news of grief or of delight or of danger, all should be

received with unruffled demeanor and a show of quiet placidity. Should an insult be offered, a proper dignity should be maintained while taking appropriate notice of it. The most momentary display of irritation or of mental disturbance is unworthy of an educated man or of a "naval officer and gentleman." No subordinate officer, nor even a mess attendant, should ever be addressed in a tone of displeasure before a Japanese.

On the other hand, an apology for any fault committed by a subordinate should not be delayed for an instant, and should be ample, with little regard for the feelings of the culprit should he be present.

A final point to be borne in mind in dealing with Japanese is their indirectness.

It is rare for two principals to deal directly with each other on business, as this is transacted largely through agents (flag lieutenants in navy, confirmed by letter), the principals meeting ceremonially, while the subordinates act according to instructions received previous to conference. Further, it must be remembered that in many cases very puzzling to foreigners an indirect statement strictly according to Japanese convention and etiquette may have a very important meaning not evident to the foreigner although more or less obvious to the Japanese party.

This indirectness of statement may be discreetly used occasionally with advantage by an expert foreigner, as for instance, censure of a third party where such censure is meant to suggest disapproval of the opposite party's course in the matter actually in hand.

Officers going to the Asiatic station might read with advantage some of the principal works on Japanese history and customs and manners, as well as political relations which are in most men-of-war libraries.

THE ANGLO-JAPANESE ALLIANCE.
(NEED OF COOPERATION BETWEEN JAPANESE AND BRITISH NAVIES).

Source: Japan Advertiser. **April 29, 1920.**

(2907)

One of the questions that is exercising the minds of Japanese publicists at present is the renewal or otherwise of the Anglo-Japanese alliance. Many articles appear in the Japanese press and the opinion seems to be general that while the British people, according to the vernacular press, are apparently indifferent regarding the renewal of the alliance, they will sooner or later awaken to the necessity of it, on account of the discrepancy which will exist between the fleets of America and Great Britain five years hence.

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After stating that the British fleet will be outnumbered and outclassed by the American Navy in 1925, the Japanese papers say that the only way to maintain the balance between the British and American fleets is by uniting the British and Japanese Navies. This is one of the reasons, they state, why it is absolutely necessary for Great Britain to renew the Anglo-Japanese alliance. The papers proceed to dwell on the great drain that the war has caused on the resources of the British and state that Great Britain, impoverished by the war, is not in a position to compete with America, who has come out richer and stronger from the European unheaval and is engaged in building a wonderful armament.

A Japanese Admiral's Views.

Vice Admiral Tetsutaro Sato, of the Japanese Navy, in the course of an article in which he seeks to prove that Japan's desire to augment her naval forces is not for any motives of aggression, makes some interesting reflections as to what part Japan may have to take in the event of armed conflict between America and Great Britain. He says that war between America and Great Britain is not improbable. He writes: "It is hardly necessary to state that the greatest powers after the World War are Great Britain and America.

"Indeed, without their friendly cooperation, peace could not be maintained either in Europe or in the Pacific. Fortunately, friendly relations now prevail between them, and the Pacific enjoys its traditional tranquility. But who can tell how long the political atmosphere will remain calm? Should any involved question arise between them it may well lead to an armed clash. The results to humanity would then be more disastrous than the outcome of the recent war, and, needless to say, the Far East will be swallowed up in the calamitous whirlpool. Upon Japan, who has to safeguard peace in this part of the world, a most important duty would devolve, namely, mediation between these two contending nations in order to ward off a most disastrous war. And should she possess no real power worthy of a mediator, her mediation might end in miserable failure. On the contrary, if she had sufficient strength behind her, none of these two nations would take a step without listening to her protests, and thus the world would be spared a war unprecedented in scale and violence. Such, indeed, would be the beneficial effect of Japan possessing a strong navy, and for that reason, if for no other, Japan must expand her navy."

Compares United States and Japanese Navies.

The admiral then makes the following comparison of the American and Japanese Navies:

Battleships.	America.	Japan.
New type	19	9
Under construction	10	4
Old type	23	6

NOTE.—The new type includes the dreadnoughts and other battleships. The old type includes other battleships.

Battle cruisers.	America.	Japan.
New type	.....	4
Under construction	6	.....
Old type	9	3

Old type includes those of the *Tsukuba* class. The United States battleships (battle cruisers probably meant) under construction are all of 33,000 tons and can move at 35 knots per hour.

	America.	Japan.
Cruisers:		
New type	23	21
Under construction	10	5
Destroyers:		
New type	72	90
Under construction or under contemplation	270	.....

America has, besides, about 300 destroyers of about 1,000 tons, whereas Japan has only 15.

"The above table," states Vice Admiral Sato, "shows how big America's Navy is. Can we, then, neglect our extension and lose our equilibrium?"

Proceeding, the vice admiral says: "If critics of Japan denounce her naval program, what should they say to the naval program of Great Britain and of America? Will any of these consent to stop building war vessels? The prosperity of Great Britain is due to her navy. If Japan is to be prosperous, she, too, must build a strong navy. Japan must have a navy strong enough to have the casting vote in any quarrel between America and Great Britain."

Say America Will Lead.

The Japanese press makes the following statement as to what will be the respective naval strengths of America, Great Britain, and Japan in the next five years:

	Battle-ships.	Battle cruisers.
United States	19	6
Great Britain	7 (?)	4
Japan	8	6

"When the vast interests of Japan and Great Britain in the southern seas is taken into consideration it is clear that Great Britain and Japan must stand together," one paper says, "and the best way to do this is to pool the Japanese and British Navies, or at least to have an understanding that in case any one of the members of the Anglo-Japanese alliance has to fight with a third party the other's navy must unite with the navy of the member of the alliance at war. A clause to this effect might very well be inserted into the Anglo-Japanese renewed treaty of alliance."

THE MARSHALL AND CAROLINE ISLANDS.

Source: Reliable. **April 29, 1920.**

(13086.)

The following information concerning these islands has been received:

There are only five foreigners (all Americans) living in the islands at present—Mr. Herrman and his uncle and three missionaries. All remaining German traders and missionaries were taken away in a gunboat in June, 1919.

It is reported that the Japanese are trying to force Mr. Melander and Mr. Herrman out of the islands by refusing to allow them any space on Japanese boats for the importation of supplies or importation or exportation of goods or products. They have been informed also by the naval officials that they are liable to be expelled from the islands at any time.

Japanese civil officials stated they were losing 300,000 yen per month on account of these islands and would like to give them up. There is much discussion concerning America's desire to obtain Yap.

In addition to the naval admiral, who might be called the governor general, there is a civil commission which deals with purely civil questions, such as the administration of justice, etc. There appears to be a very large number of Government officials, both civilian and naval, it being estimated that there are 100 such in Truk alone.

The officials state that the headquarters of the admiralty are to be changed from Truk to Palau, on account of the ease of communication with steamers coming to Palau for phosphate. This harbor is small and not adapted for a naval base.

There are only about 100 marines scattered throughout the three groups. There is no evidence of any fortifications of any kind. There are three large coal piles in Truk, Potape, and Jaluit, the amount being estimated at 75,000 to 100,000 tons, and every steamer brings more. These steamers do not coal in the islands. There is no evidence of fuel-oil tanks.

During the war the natives say the various passages were mined, but mines were taken up after the armistice.

One gunboat is kept in the islands and patrols from place to place.

No submarines have been seen in the islands.

In Truk, a rock-walled chamber, about 100 feet square, has been constructed in the side of a hill, with an iron door and wooden fence in front.

There are navy wireless stations on Jaluit, Ponape, Truk, Yap, Palau, Angaur, and Saipan. Masts still remain at Kussie, but instruments have been removed. It is understood these stations communicate with Bonin Islands and Yokosuka Naval Station direct.

The Nippon Yusen Kaisha runs a subsidized line to these islands on the average of one per month. Americans are not allowed to go from one island to another without special permission. Japanese boats will not carry American produce or supplies.

There are a number of dairy cows in the islands and also a few are raised for beef. The South Sea Colonization Co. cleared a large tract on Kusaie and planted cotton, with a laboring force of 100 Koreans and 200 natives. The project was not a success, due perhaps to too much rain, so it has been abandoned and the company dissolved.

The Japanese are very overbearing toward the natives and use "forcible persuasion" to make them work, particularly on the cotton plantations. They were also forced to work on roads at 40 sen per day, there having been quite a number of roads constructed by the Government. In return the natives hate the Japanese. The natives of Ponape are not afraid of them and show it, consequently they are respected by the Japanese.

The education referred to is of a most elementary description, the chief aim seeming to be to teach the boy enough Japanese to be able to talk to him.

Harbors.

The harbor of Truk is an excellent one and would afford an excellent place for the rendezvous of a fleet. The survey of the Mejuro Lagoon, reported before, is confirmed.

Natives say they are not allowed to go to Languar, an island, in June, 1919. It was the headquarters of the German trading firm called the "Jaluit Gesellschaft," who had warehouses, coal sheds, and the houses formerly held by the German personnel of the firm. No one was visible on the island from the ship and no one was allowed to go on shore there.

This island lies about 1 mile from the island of Ponape, and is about three-fourths of a mile by one-half mile in size. It is a high island, with a big rock in the center, 6,000 to 7,000 feet high. It is flat, no growth or vegetation, and would command the entrance to Ponape Harbor. There is a large cistern on the island, but across on Ponape there is an excellent spring which furnishes an abundance of water for all ships—capacity apparently unlimited.

CONDITIONS IN RUSSIA.

Source: Reliable.

(13185)

April 29, 1920.

"After three months' observation of conditions in southern Russia the principal conclusion evident is that all of Russia is sick unto death of war and its accompanying disorgnization, desolation, and suffering. For the great mass of the people any solution would be welcome that would establish peace and order. Elements opposing solution are communists on one side, and old régime on the other side, both following similar methods and neither entitled to consideration, but so far constituting the only elements in Russia to which the foreign powers have given any attention. No practical interest has so far been shown in the great body of the patient, lovable, suffering Russian people."

"The struggle at present is between a small, compact, for the most part seasoned and efficient force under capable leadership and occupying in the Crimea a position strong both from a military and political point of view. This position can be held possibly for a year, during which this area can be developed economically, peace pursued and content established and then by force of (?) its influence may be extended over other parts of Russia. Such is the plan as announced by the present Government and the preliminary steps taken promise fulfillment."

"On the other side are overwhelming forces directed by a striking will with unscrupulous use of force, but according to information here, giving unmistakable evidence of internal disorganization, discontent, and dissension. Both sides seem willing at this time to suspend operations and so obtain a breathing spell."

"The south Russian party gives evidence of having learned much and is no longer controlled by reactionaries who are, however, still strong enough to hamper liberal reforms. The head of south Rus-

sian Government, Gen. Wrangle, has himself learned his lesson and is even in advance of liberal ideas so far developing in his party."

"The Bolsheviks have also undoubtedly progressed. They have destroyed secretariat, corrected many gross abuses, and even developed grandiose plans for advancement of mankind. Particularly their attention to education and care of children indicate a spiritual advancement not yet reached in their conservative opponents. They have also done much to promote advance of individual political rights. All, however, has been accomplished by a brutal exercise of force and accompanied by development of a bureaucratic administration and a militaristic organization both hated by the Russian people who are also utterly opposed to communism."

"Foreign intervention in Russian affairs has accomplished nothing useful either for the Russian or for interests of the powers intervening. The Russian people have never been convinced that foreign intervention had any other aim than the self-interests of those powers. From the British Government the Russians accept assistance, but feel that at the same time the British law will be presented for payment. In Russian opinion any accomplishment by France is discredited. Italy is not regarded as a serious factor. The Russians have little consciousness of any active measures by the United States and little knowledge of any practical assistance in their distress, but although Russians and American become quickly sympathetic individually and quickly get each others point of view, yet nevertheless any activity of the United States in Russian affairs would be regarded as affecting the Russians in the domination of its influence. There is no evidence of organized German propaganda but there is a strong sentiment among the humblest types of Russians that if any external influence is necessary that of Germany is the only one capable of restoring peace and order, not realizing that Germany is now herself in preliminary stages of bolshevism. This idea comes from experiences of German occupation in 1918, when a comparatively small German army occupied south Russia, lightly disposing of any bolshevik resistance, not even serious fighting being necessary."

"Each Russian peasant knows that the appearance of German uniforms was the signal for disappearance of Bolsheviks and that in a town of fifty or sixty thousand inhabitants, peace and order was maintained by detachments of fifty or sixty German soldiers."

CREDITS EXTENDED TO FOREIGN COUNTRIES DURING WORLD WAR.

Source: Reliable.

Between April 6, 1917 and May 31, 1920, credits extended to foreign countries by the United States totaled $10,484,600,000. Figures include repayments as noted below.

Credits extended.

BY UNITED STATES DEPARTMENTS.

	Amount.	Per cent of total.
United States Treasury	[1] $9,688,800,000	92.4
Liquidation Commission	553,500,000	5.3
United States Grain and Food Commission	143,300,000	1.4
Director of Sales	[2] [3] 91,500,000	.9
Emergency Fleet Corporation	5,000,000	.....
Navy	2,500,000	.....
Total	10,484,600,000	.....

BY COUNTRY.

Great Britain	[4] $4,277,000,000	40.8
France	[5] 3,509,300,000	33.5
Italy	1,631,300,000	15.6
Belgium	[6] 368,300,000	3.5
Russia	[2] 208,100,000	2.0
Poland	155,700,000	1.5
Czecho-Slovakia	83,400,000	.8
Serbs, Croats, Slovenes	[3] 72,300,000	.7
Greece	58,200,000	.6
Roumania	37,900,000	.4
Austria	23,000,000	.2
Esthonia	15,700,000	.2
Armenia	11,000,000	.1
Cuba	10,000,000	.1
Finland	8,500,000	.....
Lithuania	7,100,000	.....
Latvia	6,000,000	.....
Hungary	1,800,000	.....
Liberia	([7])	.....
Total	10,484,600,000	.....

[1] Includes repayments, $76,310,000.
[2] Includes $20,000,000 credit to Russian Cooperative Societies, not all yet used.
[3] Includes $25,000,000 10-year credit, not yet used.
[4] Includes repayments, $64,200,000.
[5] Includes repayments, $12,100,000.
[6] Includes repayments, $10,000.
[7] $10,000, included in total.

MANDATORY RULE IN THE SOUTH SEAS.

Source: Translated from Nichinichi. **May 14, 1920.**

(13086)

The islands in the South Seas, at present under the military administration of our Navy Department, will at length have an office for their administration opened. This will take place sometime this summer. Accordingly the provisional military administration will be abolished and a purely civil régime instituted. With reference to the organization of the South Sea office, the Navy Department is of the opinion that as these islands should be regarded as of the utmost importance from the standpoint of naval defense, the head of the office should be a naval officer. On the other hand the Legislative Bureau, which is now devoting itself to the organization of the South Sea office, is of the opinion that it ought to be similar to the organization of the Government of Karafuto (Japanese Saghalien), and that a person of the Chokunin rank would be sufficient to head it. It is said that the desires of the Navy Department will not be met but the plan of the Legislative Bureau will be adopted. With the abolition of the military administration Rear Admiral Nozaki, the commander of the garrison, will be recalled and Mr. Tezuka, the director of the section of civil affairs, who has been devoting himself to development work and who is familiar with conditions, will probably be appointed chief of the South Sea office. About half the present garrison will be retained for defense and for the management of radio service. As the members of the League of Nations have not reached a decision as to details for the enforcement of mandatory rule, the Government has been hesitating to set up the South Sea office, but as a result of a conference between the naval and other authorities concerned, it was decided finally, as the peace conference had provided as a general policy for mandatory rule there should be no positive armaments and two or three other points, that there would be no objection to the abolition of the military rule and substitution of a civil régime, as this did not affect the provisions of the peace conference.

AVIATION.

H. M. S. AEROPLANE CARRIER "ARGUS."

Source: Reliable. **May 10, 1920.**

(5355)

The *Argus*, recently returned from a cruise in the Mediterranean with the British Atlantic Fleet, is now lying at the docks on the navy yard at Devonport. The primary object of her presence in the navy yard is to be fitted with the experimental landing gear now under development at the R. A. F., Experimental Station, Grain.

The following data regarding the *Argus*, is taken mostly from the 1919 edition of June:

Displacement.....15,775 tons.
Present complement:
  Officers.....40 (20 of which are members of the R. A. F.).
  Men.....600 (130 of which are R. A. F. ratings).
Fixed complement:
  Officers, R. N.....20.
  Officers, R. A. F.....6. (This number is considered entirely inadequate.)
  Men.....495 (including R. N. and R. A. F.).
(The majority of R. A. F. personnel are erstwhile R. N. A. S.)
Length, over all.....565 feet.
Beam.....68 feet.
Draft, normal.....24 feet.

(NOTE.—Five-hundred tons of ballast is carried owing to the fact that following completion of the ship as a carrier when metacentric height was computed it was found to be practically zero. It is now understood to be between 10 inches and 1 foot.)

Guns.....6–4 inches, four of which are antiaircraft.
Machinery.....Parsons turbines, four screws. Designed S. H. P. 22,000 for 20.5 knots. *Argus* is reported to have made 21 knots, although this can not be kept up for extended periods. R. P. M., 347 at 21 knots.
Fuel capacity.....2,000 tons of oil.
Hangar.....350 feet long by 68 feet wide over all, and 48 feet clear width with 20 feet height.
Flying deck.....550 feet long by 68 feet wide.
Turning circle at full speed.....400 yards (according to C. O.).

Personnel.

The *Argus* was placed in commission September, 1918. It has been stated unqualifiedly by some of the line that the present organization of the R. A. F. was a failure so far as the Royal Navy was concerned and that divided authority on board ship is an impracticable proposition and that naval aviation should be under the Navy and Army aviation under the Army, thereby eliminating the R. A. F. It has been further stated that R. A. F. officers sent to aeroplane carriers, such as the *Argus*, were dissatisfied and that probably some of them were sent there as a sort of punishment. Objections have been made on lack of coordination and cooperation, difficulties as regards discipline, and a general lack of interest in proper cooperation with naval units.

On the other hand some of the R. A. F. do not concur in these opinions and feel that it is a matter that could be properly handled if the personnel on both sides made proper endeavors to cooperate and coordinate. The recent fleet maneuvers held in the Mediterranean were considered satisfactory.

It is stated that some of the officers formerly in the Royal Navy, and who transferred into the R. A. F., did so with the idea of getting away from sea duty and, therefore, did not desire duty on aeroplane carriers, and that most of the officers in the R. A. F., whether they were formerly in the Royal Navy or the Royal Naval Air Service, did not particularly care for sea duty.

Alterations.

There have been very few alterations made on the *Argus* since she was commissioned and it is understood that very few major alterations are contemplated. She is in the dockyard at the present time for belated Easter leave and the usual overhaul incident to extended cruising, but not for a general refit.

One alteration that has been made is the substitution of a wooden chart house for the steel chart house originally installed. This change was made to improve the action of the magnetic compass in the chart house.

The following are considered desirable alterations to make in this vessel from the aviation point of view, and they may be considered at some future time if funds permit:

(*a*) The deck slope of the forward part of the flying deck is about 5° down, and it would be desirable if the after part of the flying deck had a slope of from 5 to 10° down.

(*b*) If the afterdeck could not be altered with the slope as above indicated, it is considered desirable to fit a sort of apron deck extending aft from the aftermost part of the flying deck and down at an angle of 10 to 15°, this apron being painted a very distinctive color as com-

pared with the remainder of the flying deck. This is desirable in order that the plane intending to land should approach the deck as close as practicable without danger of fouling the under part of the plane by the after edge of the deck. It is understood that one plane was seriously damaged by fouling this after edge as at present installed.

(*c*) The pallisades, installed so as to be raised above the flying deck when desired, it is said have never been used. There is a difference of opinion as to the value of these pallisades. Some consider that the installation is very desirable, especially in a seaway, as the planes on the flying deck are thus prevented from going overboard when the vessel rolls. These pallisades were not installed for wind-breaking purposes so much as for security purposes; however, as indicated, they have not been used; one of the reasons for not using them is that there is a good deal of difficulty in hoisting them up, and getting them down out of the way quickly when not needed. It was considered that their installation is desirable, provided they could be hoisted at once and lowered at once. This, of course, would require power hoisting and lowering. These pallisades consist of planking about 1½ inches thick by 10-inches wide by 12 to 14 feet long, and are spaced about 8 feet apart along the sheer strake of the deck. They drop or house into position flush with the deck when not in use, and they have apparently been in that position (housed) since the ship was commissioned.

(*d*) The after electrically controlled lift for raising aircraft from the hangar to the flying deck is not used. This lift is 60 feet long by 18 feet wide and it is practically permanently fixed in its uppermost position, the top of the lift being practically flush with the flying deck. On the top of the lift has been arranged a trap to arrest and secure aircraft when flying on. The trap consists of a grid of one-half inch galvanized wire ropes spaced 6 inches apart in the athwartship direction, extending about two-thirds of the beam of the ship. These wires are secured at the forward end and on the after end are fitted with turnbuckles or other tautening devices by means of which they can be tautened or slackened. The trap well (surface of trap deck) is about 10 inches below the flying deck and the trap wires, when taut, are on the same level as the flying deck, being therefore about 10 inches above the top of the trap deck.

It was the general opinion that this trap deck level should be more than 10 inches below the top of the flying deck and 14 inches was suggested as a more suitable depth of the well for the trap.

New Design Items.

In new designs of vessels of this character, or if these vessels were to be redesigned, the following changes would probably be made

(*a*) The smokestacks would not be led so far aft and the out-

board exhaust from the smokestacks would not be aft. The exhaust from the stacks would be led overboard on either side as is now the present practice when flying on is involved. The present practice requires two sets of fans and two sets of outboard exhausts; one aft, and one on either side. One set of fans and the after exhaust would be eliminated in a new design.

(*b*) The height of the flying deck is 60 feet above the water line and this is considered much greater than is either necessary or desirable. It is believed that this deck height should be reduced by about 25 feet so that the flying deck would be only 35 feet above the water line instead of 60 feet. This can be done by reducing the hangar headroom, lowering the smokestack blowers and reducing the deck spaces a small amount, as found practicable.

(*c*) The hangar headroom is considered much greater than necessary.

(*d*) Make the well deck where the trap is fitted 14 inches deep instead of 10 inches.

(*e*) Lengthen the trap wires over the trap deck to 75 feet or 80 feet. They are now about 65 feet long.

(*f*) Raise the trap wires a few inches above the level of the flying deck. This would probably facilitate trapping the plane more readily when she goes over a trap deck.

(*g*) Arrange the gears so that landings can be made over the bow as well as over the stern. This is considered very desirable, particularly in heavy wind. If it were practicable to fly on over the bow as well as over the stern, it is believed that landings could be satisfactorily made in almost any kind of weather.

(*h*) "Fleet speed" is absolutely necessary for a satisfactory aeroplane carrier. The cry is always for more speed and if aeroplane carriers could have greater speed than the so-called "fleet speed" it would be a most desirable characteristic to obtain.

Machines and Operations.

An item of great interest in connection with the inspection was that only a few Sopwith One and a Half Strutters, Camels, Cuccos, DH–9's, and one Fairey seaplane, a dozen machines in all, were found on board. These craft are, generally speaking, antique types and were in a poor condition of repair. Information was received that work with the fleet during the last cruise was done solely with the types of machines listed above. The absence of the standard types of ship planes, i. e., the Nieuport Nighthawk and the Parnall Panther, was particularly noted.

A slight improvement has been made in the hooks fitted to the axles of machine under carriages which serve the purpose of catching in the cables stretched fore and aft on the flying deck. A spring clip on each side of the shank of the hook has been fitted which runs

to the palm of the fluke and moves freely inboard toward the shank when feeling the weight of the cable but which snaps back in place when the cable is once secured, precluding the possibility of its slipping out. The action is similar to the functioning of an ordinary snap hook.

In regard to the present practice of landings it was learned that either one of two methods is popular; the first, that of landing as close to the stern of the flying deck as possible and taxying into the trap; the latter landing comparatively well forward and making the first contact of the undercarriage with the trap proper. As is perfectly natural, the general tendency is, however, to land too far forward to avoid the possibility of flying into the gap between the lower deck and the flying deck or stubbing part of the machine on the after ridge of the latter. In view of this tendency, it is believed that a structure of some kind (see paragraph (b) under "Alterations"), covering this aperature and leading down to the lower deck with as gradual a slope as possible, and made conspicuous by a color scheme different from that of the flying deck, would enchance the confidence of the pilots and contribute to the safety of landings. Even if such a structure, through wind tunnel model tests, was found to interfere with the smoothness of the air stream about the stern of the vessel, its advantages, it is believed, would more than compensate for its shortcomings.

On the recent cruise in the Mediterranean with the British Atlantic Fleet, three machines after landing ran over the side of the vessel, but fortunately, there were no fatalities. These accidents were reported to be due either to landing too far forward or landing normally and letting the tail down too soon with a consequent loss of rudder control which resulted in the machines running down the deck on a zigzag course and eventually falling overboard. In connection with this latter class of accident, it may be stated that the Sopwith Camel (the offending machine), is very difficult to control laterally under the most favorable conditions and the rudder and vertical stabilizer surfaces do not appear to be adequate for ship landings. It is believed that this difficulty would not have been experienced if Parnall Panther machines had been used for these are very susceptible to rudder control. The noses of dummy torpedoes carried on board have been lightened to prevent too steep an angle of dive of the torpedo as it enters the water.

No launching of seaplanes on trolleys from the *Argus* has been undertaken and when flights in seaplanes are made the craft are lowered over the side by the use of either one of the 5-ton cranes located on the lower deck just abaft the hanger entrance.

A preference for fleet work was expressed for the Clerget or Bently Rotary engines. The Le Rhone or Liberty were not considered as

suitable types for this work. The adverse criticism of the Liberty is due, it is believed, to the fact that one recently failed when taking off a DH–9 causing the pilot considerable embarrassment and eventual prejudice which has spread to his fellow pilots. This should be accepted, of course, as no criterion.

The great difficulty of accurately lining up planes at sea was the subject of comment.

General Comments.

The remarkable part of the flying deck, when rigged for flying on or flying off is that it is absolutely flush, there being no projection on any part of the deck. All fittings are either telescopic or fold down. The flying deck plating is of the familiar type of diamond tread found in our engine rooms and fire rooms.

When the *Argus* is fully loaded she is likely to be 2 to 3 feet down by the head, and in this condition she does not steer particularly well. When in light condition her stability is very small and considerable care must be exercised in taking on water ballast. To date, the vessel has not encountered any very severe weather. However, under the conditions under which she has been to sea, she is considered to be a very sea-worthy vessel. On account of her great freeboard she is hard to handle in a heavy wind although with the very large rudder installed, she is ordinarily handled remarkably well. Landings of aircraft have been successfully made on board with a roll of 6 to 7 degrees on the ship.

The wind speeds necessary for flying off the following types of machines carried are listed as a matter of interest:

	Knots.
Sopwith Camels	0
One and a Half Strutters	10–15
Sopwith Cucoos	20
DH–9's	20

The Camels and One and a Half Strutters have one virtue which makes them adaptable for landing on board in their low landing speed. The general practice now is to bring them on at a relative speed to the ship of 10 knots.

It was stated by one of the flying officers that spotting and fire control work was done by one of the DH–9A's carrying a pilot and two observers. One of the observers spotted the fall of shots while the other transmitted corrections by radio to the firing ships. The functions of spotting and signaling it will be noted therefore, were not entrusted to a single observer. It was intimated that considerable work of this character would be undertaken in the near future.

There appears to be nothing better in sight as a service type of seaplanes than the Fairey or the Short and the scheme of cooperation of the R. A. F. with the Navy provides for the use of either one

of these types. The seaplane, however, is not thought highly of by R. A. F. personnel afloat as a type of machine of value and they much prefer the land machine fitted with air bags. It may be added also that kite balloons are not looked upon with favor for observation purposes. The difficulties entailed in fitting towing vessels with suitable types of winches and other gear necessary for the operation of these craft has no doubt contributed to this feeling.

The average altitude from which torpedoes are dropped from the standard type of torpedo-carrying aircraft in the fleet, the Sopwith Cuckoo, is 15 feet, and this altitude is seldom exceeded.

The machine shops, and so forth, are forward above the main deck occupying two deck heights between the main deck and the boat deck. There is a well fitted carpenter's shop, machine shop, blacksmith's shop, and foundry. In the machine shop there was a 12-inch lathe which had seen very little use.

The ship's ventilation is quite elaborate and quite satisfactory except for the fact that the smokestack exhaust goes out astern. There is a tendency for the gases from the smokestack to be drawn back into the ship's ventilation system. This is particularly true with wind abaft the beam or astern.

The assignment of R. A. F. personnel and flying equipment to aircraft carriers is a function of the coastal area branch of the air ministry, while plans for the operation of aircraft with the fleet are drawn up by the Admiralty with the assistance and counsel, of course, of the air force.

It was stated that on the last cruise the *Argus* kept station with the fleet at all times and performed all fleet maneuvers, although the need for additional speed in vessels of this type was emphasized.

It was considered that the device conceived at Grain for hooking aircraft in flight on a suspended cable is not applicable to shipwork. There are obviously excellent reasons for this opinion. It is highly speculative whether this feat can be successfully accomplished on a flying field with every condition of wind and weather ideal, and when the gear is carried on a moving ship never entirely free from rolling and pitching movements which are transmitted in an aggravated degree to a highly suspended cable well clear of the center line. The abnormal degree of accuracy in piloting called for is considered prohibitive to success. This experimentation, however, will be followed with the keenest interest.

THE ROYAL AIRCRAFT ESTABLISHMENT AT FARNBOROUGH.

Source: Reliable.

(13197)

May 26, 1920.

The Royal Aircraft Establishment at Farnborough was formerly called the Royal Aircraft Factory. This establishment is under the immediate supervision of the director of research air ministry, and the primary activity is the carrying on of research and experimental work in aeronautics for the Government. There is included in the organization a manufacturing division, the function of which is to produce equipment for the experimental division and to manufacture in small quantities new instruments, devices, etc., considered of sufficient value to warrant their trial in the service. If these instruments, devices, etc., when subjected to service trial, are found worthy of general adoption, the practice is to release the specifications to some commercial firm better qualified to produce in quantity.

A total of approximately 1,300 men are carried on the rolls of the station, and this number includes a test flying division composed of one squadron leader, four flying lieutenants (captains), and five flying officers (lieutenants). All of these officers are of the R. A. F., and their duties are solely flying duties. Aside from this R. A. F. contingent, the remaining personnel are all civilians.

The experimental division is divided up in sections which deal with some particular subject, such as engines, meteorology, instruments, wind channels, etc. Each one of these sections is headed by a thoroughly trained foreman, an expert in his particular field of work.

The activities of the establishment are varied, and there is much of interest going on.

Instruments.

An apparatus for indicating the position of, and coordinating the controls on, aircraft has been recently tested in flight at Farnborough on a Vickers-Vimy machine. Suffice to say that the Vickers machine, equipped with this device, entered a cloud bank of approximate thickness of 4,000 feet at an altitude of 5,000 feet. The pilot throughout the flight through the cloud was always aware of the exact altitude of the machine. The red and green lights functioned perfectly and when the machine emerged from the cloud the pilot found himself on an even keel, steering on the entering course and at the entering altitude.

The R. A. E. aerial sextant Mark II was carried by R. A. F. machines which recently took part in the Cairo to the Cape flight, and reported by the users very satisfactory. It was noted that the altitude scale of this instrument is graduated in increments of 10 minutes although readings correct to 2 minutes may be estimated.

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Fifty R. A. E. gyro turn indicators (Mark V) have been made at Franborough and will shortly be tested by the R. A. F. on long-distance flights.

Engines.

A great deal of experiment is now going on with air-cooled engines, and a great service future is predicted for engines of this type. Aluminum cylinders shrunk on steel liners have been tried, but great difficulty has been experienced in securing a proper fit owing to the difference in expansion of the metals, resulting therefore in a loss of the cooling properties of the aluminum cylinder. It is naturally at the combustion chamber end that heating difficulties are most serious to contend with in air-cooled cylinders, and it is believed that the aluminum head if properly secured to the steel portion of the cylinder will go a long way toward solving present difficulties.

The types of engines used in this experimentation are the A. B. C. Wasp, 170 and 200 horsepower, and the Dragonfly, 320 horsepower. By far the most satisfactory type of air-cooled cylinder yet produced is the Wasp ($4\frac{3}{4}$ inches bore by $6\frac{1}{4}$ inches stroke), of which the lower portion is steel with steel fins and the head is an aluminum casting which is shrunk on an overlap of about $1\frac{1}{2}$ inches projection on the upper portion of the steel cylinder.

The head of the engine research department stated that in spite of the molding and foundry work difficulties this form of air-cooled cylinder construction would be persisted in as the product is eminently superior.

As the probable limit in the size of air-cooled cylinders has for some time been a matter of speculation it was decided at Farnborough to construct one which would develop approximately 80 horsepower and subject it to running tests. This has actually been done and so far, the cylinder has not manifested any serious defects after intermittently running 20 hours at high average speed.

Tests are also being conducted with heavy water-cooled engine cylinders for commercial aviation purposes. One seen on the stand had an 8-inch bore by 10-inch stroke and developed 120 horsepower.

Direct fuel spray feed is being experimented with and has been applied to large air-cooled cylinders. It is reported that the feed functions extremely well on the intake stroke but not entirely satisfactory on the compression stroke. The fuel consumption for the power delivered is reported to be high.

A Liberty engine has been fitted with a blower type of supercharger and the power raised from 250 to 360 horsepower at altitude conditions existing at 12,000 feet. Difficulty with the rotors, however, has been experienced, owing to the extremely high rotational speed (25,000 to 30,000 revolutions per minute); the bearings burn

out and the fans themselves melt and break up. A new fan is now being designed by the R. A. E., the fins of which are set in very tightly and anchored with bulbular ends, and a new type of ball and roller bearing is being used instead of the Skefo bearing. It is believed that this product will be a great improvement on existing types.

Too much importance can not be attached to the development of superchargers. It is obvious that the Government with this perfected device in its hands can easily hold at bay the enemy air forces of any nation not so equipped. The British deeply appreciate this truth and are devoting great energy and considerable funds to this particular field of work. In this connection it has been said that, in his opinion, the supercharger had reached a higner stage of perfection in America than in England, and it is the present plan to journey to the United States in the near future and inspect the various planes at McCook field and elsewhere, where experimentation of this character is being carried on.

Metal Aeroplane Construction.

The cost of steel or duralumin wings for aeroplanes is very great and only in extensive production can the price be brought down to reasonably conservative figures. The general opinion regarding the efficiency of metal wing construction expressed is that while it undoubtedly stands exceptional static tests for strength the structure does not hold up when subjected to the ordinary vibration experienced in flight. Steel wings have been built at Farnborough which weigh less per square foot of covered surface than similar models constructed of wood, but as the particular sum allocated for experiments in this work has been expended further development at present is at a standstill.

Servo Motors.

Servo motors have been fitted to one of the Handley-Page machines and have been successfully tested. Pilots complain that there is a certain amount of lag in the action of the motors which does not contribute entirely to their composure, but the chief technical assistant said that it was the ultimate hope to eventually educate pilots to the point of not needing the feel of the controls and the pilots themselves state that they may get accustomed to this novelty in time. Of the various types of Servo motors used the Cooper is considered the best.

Propellers.

An interesting experiment has been carried out with low-pitch propellers for determining the maximum effective rotational speeds. A peculiar coincidence has been discovered in the fact that when the propeller tip speed approaches the velocity of sound (1,100 feet

per second) the slip stream ceases altogether and the propeller seems to have a tendency to draw up loose articles from the ground (sometimes slightly in the rear) and to hurl them in all lateral directions. An additional item of interest is that the slip stream stops suddenly throughout the full length of the blade.

Experiments are being carried out with variable pitch propellers. The most successful results obtained so far have been with four-bladed propellers. One of this type has been designed at the R. A. E. and fitted to a 200-horsepower R. A. F. engine, mounted in a BE–2. The noticeable peculiarity of this propeller is that it has no boss. Four additional small metal fan blades have been fitted between the propeller blades and serve the function of creating the draft for cooling the engine normally supplied by the boss. The change in pitch is accomplished by an oil-drive engine, which works on the same principle as the steam steering engine. This propeller is reported to be very efficient in flight, but allowance, of course, must be made for the fact that it is fitted to a comparatively low-powered and very slow-speed engine.

Wind Channels.

Three wind channels are located at this establishment. One is 4 feet in diameter, and the remaining two are both 7 feet in diameter. The latest constructed of the 7-foot variety is said to be the most modern wind channel in England. The air speed developed in this channel is 240 feet per second. The exhaust end is bell-mouthed and extends beyond a perforated brick wall. Air is exhausted against a solid wall and returns to the intake end through the perforated wall. This feature is said to break up any bad air currents which might otherwise be formed.

Mufflers.

Considerable experimentation has been carried out with mufflers in an attempt to subdue engine noises without creating too much back pressure. This activity, in the main, is considered successful, but the R. A. E. staff appreciate that from a service point of view a silent engine is not of much use except in so far as it contributes to the comfort of the pilot. Experiment has apparently proved that even perfect muffling will by no means silence aircraft in flight, and the opinion is held that propeller noises and singing noises set up by the machine wires, aerofoils, etc., are audible to a listener on the ground when the engine exhaust can not be heard. The value of muffling for commercial aviation service is appreciated.

Bimotored Machines.

Considerable difficulty and several accidents have been experienced with machines of the DH–10 and Vickers-Vimy type in having one motor cut-out when taking off or when the machines are near

the ground. To offset the difficulties entailed in case of such a failure a device has been rigged on one of the DH–10's, which consists of a control from the rudder to the throttle, the action of which is as follows:

If the starboard motor fails, the first tendency of the pilot is to give the machine hard-right rudder, which automatically shuts the port throttle, cuts the port motor, and thereby eliminates the excessive torque. Another device which has been tried is the setting of the vertical stabilizers so that the slip stream from the driving motor, in case of the failure of the other, tends to bring the machine back to its normal course. It is proved, however, that this latter method is not entirely adequate, and it has the further disadvantage of greatly increasing the drift on the empennage. In this connection the firm of Boulton & Paul are now experimenting with synchronizing gears for bimotored machines of their P–8 Atlantic type, fitted with two 450-horsepower Napier Lions. This gear is operated by a techometer drive, which, if the revolutions of one motor fall off, acts on the throttle of the other and automatically cuts out its revolutions per minute. This gear, however, does not function, so that the revolutions per minute of the slow motor are increased. In other words, it does not work both ways. It may be connected or disconnected in flight.

Miscellaneous Activities.

A Handley-Page 0400 type was fitted with a seat for an observer in the afterpart of the fuselage, close to the empennage. From this seat a long outrigger extended laterally to the general vicinity of the slip stream from the starboard motor. At the end of the outrigger were fitted five static pressure heads, one pointing directly forward in line with the axis of the machine and the other four up and down to the right and left, respectively, of the central tube. The outrigger was pivoted so that the outer end might be swung to any part of the slip stream. The difference in pressure readings on the various heads are registered on an instrument in the observer's cockpit, and from a reading of this the direction and force of the slip stream at various points can be determined.

The R. A. F. 19 wing section was seen on a BE–2. This aerofoil has a very deep camber. The stalling speed of a BE. with an ordinary wing—like, for example, the R. A. F. 16—is unusually high, but with the R. A. F. 19 it has been reduced to approximately 30 miles per hour. As would be expected, the climbing qualities of the R. A. F. 19 are very good, but, in general, it is considered inefficient.

Experiments in camouflaging have been recently conducted. Three Salamanders were observed from a superior altitude. One was hand painted, one covered with printed fabric, and the third with PC–10. The one hand painted with the old war style of dazzle camouflage was found to be the least conspicuous of the lot.

A BE. machine was noted, the fuselage of which was cut in two behind the observer's seat. The lower part of the severed section had then been hinged on and supports so rigged from the upper section that during flight the weight and lift of the tail might be registered on recording instruments in the observer's cockpit.

An SE–5 was noted which was equipped with a special shaft on which the propeller fitted on a ball race was free to move forward against the action of a spring. There is registered on the dial of a sensitive instrument located on the pilot's dashboard, the degree of thrust obtained during various conditions of flight. A spring device was also fitted to the propellor boss which indicated the amount of torque developed.

Another SE–5 had fitted to the side of the fuselage a padded rod capable of fore and aft movement from the pilot's seat. The end of the rod could be pushed out between the propellor blades and in this position, of course, prevented the propellor from rotating. This device is used when accurate gliding experiments are being conducted.

A device has been fitted to the control column of one of the machines which consists of a long rod normally secured to the under side of the fuselage in flight which may be dropped from its after end when a landing is about to be made. The function of this rod is to automatically give the machine up rudder when near the ground. Its use would be particularly adaptable to landings at night or in thick weather and it has already been successfully applied to flying boats at Grain.

Wings of various aspect ratios have recently been tested, namely, 1 to 4, 1 to 6, and 1 to 9. Nothing has evolved from this experimentation to indicate that the normal ratio 1 to 6 is not the best.

A Bristol Fighter was noted which was equipped with a support behind the observer's cockpit for a cinematographic outfit. The camera could be placed high enough to take unobstructed pictures over the tail and well forward on each side, of machines in this zone.

Tests are being carried out with various types of radiators. It is the usual practice to make preliminary tests in the wind channels. Air tests are carried out by fitting a section of the radiator to be tested alongside the fuselage. These sections are generally 1 foot square, and are fitted in specially constructed frames. Water passes through the sections under test from the engine circulating system and thermometers are provided to take the entering and leaving temperatures. Movable supports form the mountings for the radiator frames and these are held in place by springs. The resistance of the radiator sections can therefore be measured by recording instruments in the observer's cockpit.

A BE–2 was noted which had been lined up with reverse stagger. The machine was, of course, most freakish in appearance, but no

special significance is attached to this conversion. It was reported to have been flown successfully.

The types of machines generally used for experimental purposes are the BE. and SE. types.

GERMAN MILITARY AND NAVAL AVIATION SITUATION.

Source: Reliable. (11969)

May 5, 1920.

"Articles 198–202 hit the German Army most severely. They forbid the equipment of the German Army with any flying machines whatsover, and prescribe the surrender of all aeronautical material including shelters of every kind for aircraft.

"An army without aviators is, under the present conditions, blind and helpless when opposed to any enemy, external or internal, possessing flying machines. As regards the necessity of the air weapon, the most tremendous exertions are being made in all the modern armies to push the development of their power in the air. In the repression of internal enemies the air weapon is of the highest significance. The great successes of the English air forces in putting down the disorders in India and Somaliland are only cursorily mentioned. In all the Communist and Spartacist uprisings in Germany "red" aeroplanes were used against the Government troops. Because of the fact that the peace terms do not permit Germany to maintain aeroplanes, boundless dangers beset the Government authority in the interior."

"Germany is the first modern industrial nation to go through the revolutionary process. The results and conclusions of this revolution are unforeseeable since all historical parallels are lacking. The industrial, the technical era compels innovations, demands new measures, which, after so short a period already appear antedated.

"In the battle against modern disorders and uprisings, the aeroplane is as indispensable as the use of the rapid-fire gun, trench mortars, machine guns, armored cars, telephone and wireless. The flying machine, in military control, is the only method of communication uninfluenced by either space or time for use in fighting or enlightening excited and misled popular masses. The severe internal disorders of 1919–20 have produced irrefutable and innumerable proofs of this.

"Within the great industrial centers of Germany speedy, timely, and efficient distribution of circulars and information leaflets about the position and purposes of the Government, about the manner and aim of military measures and advance intentions, was only rendered possible by means of the military flying machines. In many parts of Germany it was only in this way that an early and successful stop was put to the spread of the revolutionary flames.

"The speedy military organization of an air service over all Germany during the last disorders of the 13th of March, 1920, rendered incommensurable services and produced important successes. To condemn Germany in a most critical period to a total deprivation of aeroplanes is equivalent to depriving her of her most essential weapon against inner disorders and Bolshevism.

"Even though the revolutions of former eras, of former centuries, of former millenniums, were fought out on the ground, this does not at all prove that this is also applicable to 1920.

"In strict consistency it could be insisted that muzzle-loaders and flint-locks supersede rapid-fire and machine guns, horse teams take the place of railroads and automobiles, and mounted couriers and runners be substituted for wireless and telephone.

"The German authorities have taken the greatest pains to convince the military experts of the Allies of the impossibility of absolutely dispensing with military aeroplanes, but hitherto the clauses have remained unchanged.

"*How far has Germany already carried out the clauses of the Treaty of Versailles with regard to military and maritime navigation?*

"Articles 198 and 199 state that Germany's military forces shall not include any air service, and that within two months after the Peace Treaty has entered into effect the personnel of the air service is to be demobilized.

"During the winter of 1918–19 Germany maintained 50 flying units, with corresponding staffs and managements (administrations), for the purpose of assuring internal order and the safety of the eastern boundary; and these units had a strength of 1,300 officers and 9,000 men with 800 aeroplanes, as well as a reserve of 1,400 aeroplanes. Immediately after the ratification of the peace treaty, the German Government set about in all loyalty to fulfill the conditions regarding the demobilization of the border defense flying units and also the diminution of the flying corps in the interior, and this in all speed and to a very large extent, despite the opposition of the army.

"At the end of November, 1919, there remained only 13 flying formations, one aerial staff and 2 higher administrative bureaus, with a total strength of 300 officers, 2,600 men, 400 aeroplanes, and a reserve of 900 aeroplanes.

"By the 10th of January, when the peace treaty entered into effect, the flying corps of the German army had been reduced to a minimum in aeroplanes, without which an army in the interior of the country could not fulfill its obligations. On the 10th of January, 1920, there remained only three military aerial squads and two aerial staffs with a total strength of about 190 officers, 2,000 men, and only 225 service aeroplanes. In addition there was a reserve of approximately 600 aeroplanes to cover losses.

"In the beginning of February the German Government submitted a detailed memoire to the Inter-Allied Air Service Control Commission, in which the urgent necessity was explained for the retention of several aerial squads for the use of the Reichswehr until inner political and industrial conditions had reached a healthy plane. A temporary retention was requested of eight military aerial squads and of a border-defense aerial echelon in East Prussia, containing 165 officers, 1,865 men, and 172 unarmed service aeroplanes, until the 10th of March, 1920, on which day, according to article 190 of the peace treaty, the flying corps had to be demobilized.

"On the 10th of March the flying corps had been reduced to 172 service aeroplanes, to the number requested in the memoire. In addition the numerous aerial formations returning from the Baltic Provinces were completely demobilized by this date.

"The refusal to sanction the retention of eight aerial squads and of one echelon, according to the above request, was communicated to the German Government by the ambassadors' council in Paris at the beginning of April. Up to that date the eight aerial squads had continued their activity with the knowledge and without the dissent of the Inter-Allied Air Service Control Commission. The services performed by these fliers during the general strike in March and in putting down the disorders in the Ruhr district and in Saxony were extraordinary and decisive for the victory of the National Government against Bolshevism.

"Since, however, the negative decision of the ambassadors' council was cast before the date of the March disorders, since when events have irrefutably proven the absolute impossibility of maintaining internal order in Germany without the temporary use of military fliers, then, although all military flying activity has been ended, even against anxious dissidence, the demobilization of the few remaining military aeroplanes has at the same time been urgently requested.

"It is vital to emphasize that no fundamental amendment of article 198 is contemplated by Germany, but that, rather, a postponement in the demobilization time limits is desired until the arrival of orderly inner political conditions.

"No expert would consider this motley remnant aggregation of one-time proud service, light and unarmed and of all possible types, amounting in all to 170 aeroplanes, as a possible fighting force. It is a sad and shameful task for the former powerful German nation to be begging for the retention of such a flying troop. Surely this comparatively slight concession would in no way constitute a strengthening of Germany's foreign prestige, but it would serve solely the purpose of maintaining internal order, a matter of equal interest to Germany's creditors.

Aerial.

"As regards the clauses of the peace treaty relating to the marine air service, all the agreements entered into with the Inter-Allied Air Service Control Commission have been thoroughly executed.

"The entire German sea air service has been completely demobilized. Part of the serial stations have been turned over to a civil administration. It is only for the purpose of assisting in the very necessary mine-searching operations that several sea aeroplanes have been allowed to remain in service with the consent of the Allies, and their demobilization will follow as soon as their mine-searching tasks have been achieved. The total number concerned is 60 seaplanes, distributed among the stations Norderney, Wilhelmshaven, Holtenau, Bug, Nest.

"The German sea air service has ceased to exist. All mobile formations have been demobilized. The Entente has consented to the retention of only 200 men of the marine airship section in order to put into operative condition the airships which are to be surrendered to the Entente. As soon as this task is over then this last unit of the German marine airship service will vanish."

H. M. S. "EAGLE."

Source: Reliable. **May 19, 1920.**

(5355)

This vessel recently left the contractors' works, Newcastle-upon-Tyne, and proceeded to Portsmouth Dockyard.

Tests with aircraft are being conducted on her from time to time during her stay at Portsmouth, where the usual finishing work is being done on the vessel subsequent to her delivery by private contractors.

The Chileans continue to make certain demands or requests on the British with regard to this vessel. Chile considers that she should be reconverted and turned over to the Chilean Government. The British have offered a substitute capital ship in lieu of the *Eagle*.

There is no doubt but that the British will retain the *Eagle* for at least six months to carry out such tests with aircraft as they consider desirable. It is thought that this ship will not be reconverted and turned over to the Chileans.

In connection with the subject of pallisades as mentioned in connection with H. M. S. *Argus*, there appears to be a good deal of misinformation with regard to the necessity for and the use of such an installation. The first idea was that the pallisades would serve as a wind screen for the flying deck, and it was intended to fit the pallisades so that a canvas screen could be readily rigged and un-

rigged along the pallisades. This, however, was not done. The second idea was that the pallisades would act as a safety device to prevent planes from going over the side in a seaway or when flying on, or both.

These pallisades have not been used in the *Argus* and it is understood they are not fitted on the *Eagle*.

Three United States naval officers recently witnessed a large number of "movie films" at a private exhibition given by Sir William Jury in order to select films for purchase for the United States Navy. It was noted that in no case were pallisades used.

The arresting device (trap) on the flying deck of the *Eagle* differs from that on the *Argus* in that the wires are installed so as to function above the level of the flying deck and not at the level or in the well, as on the *Argus*. On the *Argus* the landing plane forces its arresting hooks through the wires; on the *Eagle* the wires tend to force themselves through the hooks, i. e., force themselves above the flukes of the hooks, thus making the entrapping of the plane more readily accomplished. The plane can be trapped without touching the flying deck, due to the fact that the wires are above the flying-deck level. While the difference of procedure on the two carriers may appear minor, the results to date indicate a marked superiority of the *Eagle* type of arresting device. The height of the wires above the flying deck on the *Eagle* could not be ascertained, but it is understood that it is only a matter of 8 or 10 inches.

AERIAL PHOTOGRAPHY IN ITALY.

Source: Reliable.

(7053)

April 21, 1920.

The first experiments in aerial photography were begun in Italy in 1906 by the army photographic section. A small hydrogen balloon was sent up to a height of not more than 1,000 meters, carrying the photographic machine and a single plate. The shutter was controlled electrically from the ground and was snapped when the plate was judged to be in a horizontal position. The balloon had to be pulled down and a new plate inserted after each exposure.

At the international photographic congress at Brussels, 1910, Italy was awarded a prize for aerial photography. In 1908 the Tiber River was photographed, Pompei in 1910, Ostia in 1911, and Venice and Chioggia in 1913–14. This topophotography proved of great value in the subsequent systematization of river navigation, archæological excavation and canal planning in the lagoons, swamp lands, etc. During the war in Libia with the Turks aerial photography was tried by Italian aviators aboard primitive lighter-than-air apparatuses.

It is calculated that over 200,000 aerial photographs were taken on the Italian front during the late World War.

The first successful machines were the corto fucco (limited range), 150 milimeters, carrying a single plate. These were gradually modified and improved to be operated in the modern types of fast airplanes.

The best machine (Italian) for planimetric photography is the distanza focole (unlimited range), 240 milimeters, multiple plate (12, 24, 48, and 96 plates) 13 by 18.

Considerable after-war progress has been made in stereoptic planimetric and panoramic photographing. Aerial photography has been used in making plans of Rome, the armistice lines, and many hundreds of topographic and hydrographic maps. In this latter field aerial photography is destined to become of prime importance. Experiments are also being made in aerophotogrammetrics for horizontal and altimetric reductions of aerial photographs.

ALLOTMENT OF AIRCRAFT OF ROYAL AIR FORCE TO ROYAL NAVY.

Source: Reliable.

(12646)

May 10, 1920.

The scheme of cooperation of the Royal Air Force with the Royal Navy provides for the following units of aircraft to be allotted to the Royal Navy for employment in conjunction with naval training and operations for the fiscal year 1920–21. Where an increase of allotment is sanctioned for the fiscal year 1921–22 the amount is stated.

(*a*) One squadron (18 aeroplanes) Parnall Panther ship aeroplanes (two-seater reconnaissance). These are in replacement of Sopwith One and a Half Strutters. For the financial year 1921–22 this will be increased to 1⅓ squadrons (24 aeroplanes).

(*b*) Two seaplane carriers, each to carry one flight (6 seaplanes) of two-seater Short float seaplanes. One flight of Fairey float seaplanes to be kept in reserve.

(*c*) One flight (6 aeroplanes) Nieuport Nighthawk single-seater fighters. These in replacement of Sopwith Camels. For the fiscal year 1921–22 this will be increased to one squadron (18 aeroplanes).

(*d*) Half squadron (9 machines) Sopwith Cuckoo (200 horsepower H. S. Viper engine) single-seater torpedo carriers. This to be increased to a full squadron (18 machines) for the fiscal year 1921–22.

(*e*) Half squadron (5 boats) of F. 2–a flying boats. This to be increased to a full squadron (10 boats) for the fiscal year 1921–22. This unit will be based ashore at Felixstowe or at fleet bases as required.

It is further proposed, but has not yet been finally sanctioned, to base one-half squadron of F. 2–a flying boats at Malta and Alexandria, respectively.

(*f*) Lighter-than-air. One rigid airship (R. 34).

No allocation of kite balloons has been made, but it is understood that the subject of the future employment of kite balloons in conjunction with naval operations is still under discussion.

It is stated that no reserves are to be kept over and above the machines actually detailed to the units mentioned. All machines in existence surplus to these requirements will be disposed of.

BRITISH AIR ROUTES.

Source: Clipping from "The Far East." **April 24, 1920.**

(7424)

"Five great British air routes were described by Maj. Gen. Sir Frederick Sykes, controller general of civil aviation, in an address to members of the Royal Geographical Society. Egypt was described as the key to the imperial air ways, the first five of which are (1) Egypt to India; (2) Cairo to Cape; (3) India to Australia; (4) England to Egypt; (5) England to Canada. Regarding the Cairo-to-Cape route, Gen. Sykes stated there are no fewer than 43 prepared aerodromes along the line, with an average distance of only 124 miles between each. Even now there are 24 stations organized with supplies of petrol and oil. Thanks to the cooperation of Holland, the route to Australia is practically completed, but, if necessary, by flying from Singapore to Christmas Island, in the Indian Ocean, and thence to Australia, an all-red (British) route could be obtained, although it would involve two long stages of 810 and 849 miles, respectively. The next war said Gen. Sykes would in all probability begin with a fight for the mastery of the air which would be secured by attack and defense. He would make a large reserve of aviators to be ready for possible wars, and hoped that before long the air forces of the empire would be welded into one force, coordinated by an Imperial General Staff. Great Britain he added, must become the carrier of the world not only on the sea, but in the air.

DESCRIPTION OF GIANT CAUDRON AIRPLANE.

Source: Reliable.

(6188) **May 14, 1920.**

General Characteristics.

Trimotored: each motor of 250 horsepower, Canton-Unne, type, Salmson Z–9.

Wing spread	meters	25
Total length	do	19
Height	do	5.45
Supporting surface	square meters	155
Dead-weight (approximately)	kilos	3,400
Loading	do	2,100
Useful load	do	1,205
Tank capacity	do	985
Total weight	do	5,500
Tank capacity, gas (2 tanks)	liters	520
Tank capacity, oil (3 tanks)	do	50
Speed, per hour	kilometers	165
Duration of flight	hours	6

BREGUET HYDROPLANE, TYPE 18-T.

Source: Reliable.

(13204) **May 14, 1920.**

This hydroplane, which is prepared for the sea-plane aviation meeting at Monaco, is a modified type 18 Breguet equipped for water-flying by the substitution of three floats, one large central and two lateral which replace the landing gear.

Following are the general characteristics:

Total surface	square meters	73
Length over all	meters	11
Spread	do	17.5
Empty weight (including 300 kilos for the floats)	kilos	2,000
Duration of flight	hours	6½
Speed	kilometers per hour	170
Speed with 1 motor	do	110
Weight of fuel for 6½ hours' flight	kilos	450

Motors: Two 300 horsepower Renault, geared to a central propeller.

VICKERS MULTI-ENGINED MACHINE.

Source: Reliable. **June 2, 1920.**

The following information regarding a multi-engined flying boat, now building by the Vickers Co. under orders of the British air ministry, has come to hand:

(*a*) This craft is reported to be the largest aeroplane in the world.

(*b*) Powerplant: Eight 600 horsepower Condor engines driving four propellors.

(*c*) Overall length of hull, 120 feet.

(*d*) Beam, 20 feet.

(*e*) Displacement (normal load), 101,000 pounds.

(*f*) Passenger carrying capacity for short flights, 100 persons.

(*g*) Name of craft, Vickers *Vigilant*.

JAPANESE SEA PLANES.

Source: Reliable.

(13203)

May 4, 1920.

An interesting feature of the expedition to Androfsky, North Saghalien, is that Japanese newspapers state that a seaplane from the battleship *Mikasa* preceded the debarkation of troops, dropping a proclamation from the Japanese expeditionary commander to the inhabitants of Androfsky. This is the first actual indication that Japanese battleships carry seaplanes.

ROME-TOKIO FLIGHT.

Source: Reliable.

(12804)

April 16, 1920.

In conversation with an officer attached to Italian aviation headquarters it was learned that the original intention of the aviation officials was to equip the flight planes with SVA motors, and the stations along the route were consequently furnished with SVA spares. At the last moment, however, Caproni motors were used and the planes were sent on the flight without sufficient stock of spares.

NEW TYPES CAPRONI AIRPLANES.

Source: Reliable.

(6363)

April 19, 1920.

It has been learned that the newest types of Caproni planes are to be equipped with both Isotta-Fraschini and Caproni motors.

Certain Italian officials do not speak highly of the Caproni planes.

ENGINEERING.

DIESEL ENGINES—GERMAN POWER-BOAT TYPE.

Source: Reliable. (13186) **May 18, 1920.**

On 13 May, 1920, three small German Diesel engines were viewed by representatives of the staff representative, London, at the Admiralty dockyard, Chatham.

Two of these engines are called Benz Diesel and one a Daimler Diesel; they were obtained from three German motor boats taken from one or more of the German men-of-war surrendered at Scapa Flow. One of the Daimler engines had been removed from the motor boat and was partly dismantled; the other two engines were still in place in the motor boats. These three boats are about 50 feet over all, with covered engine room forward and covered cabin aft, the general design being somewhat similar to that of our 50-foot steamers.

The Benz engines are six-cylinder, vertical, single-acting, four-cycle; bore, 220 millimeters; stroke, 220 millimeters; weight, about 6,000 pounds (British stated the weight of engine complete was $2\frac{3}{4}$ tons); the maximum revolutions per minute probably about 450 to 480, and the brake horsepower at 450 revolutions per minute, probably about 100 to 125. All name plates, data plates, and gauges had been removed by the Germans before the boats came into the possession of the British, and as no tests have been run by the British there is no operating information.

The British are engaged in making working drawings of the Benz engines at the present time, but we were informed that they do not intend to run any tests on the engines or make any further use of them after the drawings have been completed, although for a very small expense the engines could be put in operating condition, particularly one of the Benz engines, which is clean and well greased all over; the other two engines, however, are considerably rusted.

The Benz engines have one inlet valve and one exhaust valve per cylinder, and in addition an exhaust port uncovered by the piston at the bottom of the stroke. The starting and reversing is effected by a sliding cam shaft which causes the inlet valves to become exhaust, and vice versa; at the same time starting air is admitted to the proper manifold, the two mainfolds, inlet and exhaust, being connected together at the after end of the engine to a common fitting in which is arranged a piston valve which controls the flow of either starting air or air from the atmosphere to either manifold.

The foundation and crank case are of cast steel; cylinders, cast iron; all cylinders being separate units with detachable heads, fitted with the usual water service for cooling, as are also the inlet and exhaust manifolds.

Lubricating oil is fed by pressure pumps to all main bearings and apparently through the hollow crank shaft to the journals and from the journals through piping on the connecting rods to the wrist pins.

The flywheel on one of the engines had vaned spokes with the crank case opposite open for crank case ventilation. The crank case is fitted with large inspection doors for access to the connecting rods and main bearings.

A bilge and a circulating pump are located at the forward end of the engine and driven by eccentrics from the crank shaft.

A three-stage air compressor is incorporated as a seventh cylinder of the engine and driven from the main crank shaft.

Air storage is provided by a steel bottle, charged from the air compressor, the bottle being located outboard of the engine on the starboard side of the boat. This bottle was of about 100 liters capacity and had the marking "120 atmospheres, 1914," stamped on it.

The clutch is the ordinary jaw or "dog" clutch. The engine shaft has a universal point forward of the line shaft coupling. The engine starts on compressed air effective on three cylinders; reversing by compressed air effective on all six cylinders. The air compressor has its three stages in vertical line; one stage is used for starting; the other stages for injection.

The most interesting features of this engine are the method of reversing and the ventilating flywheel.

The Daimler engine, which was apparently older than the Benz, was also a vertical six-cylinder, single-acting, four-cycle engine. There was no accurate information obtainable on this engine as to sizes of parts, etc. The British authorities stated that in their opinion this engine is practically the same as the one described in the Motor Ship and Motor Boat of 23 June, 1913. This engine was built in 1913.

On this assumption, no drawings are being made of this engine and no work is contemplated at Chatham. The following data on this engine was obtained but is not capable of complete verification:

Horsepower, 100 to 150.
Revolutions per minute, 500 to 550.
Weight, 80 pounds per brake horsepower.
Fuel consumption, 230 grams, or about 0.5 pound per brake horsepower hour.

186635—20——8

Directly reversible without a reversing gear. (Ordinary early Diesel cam-shaft reverse, similar to Nuremberg design of 1913).
Reverse by compressed air, overhead cam shaft.
Twin-cylinder castings.
Totally inclosed type.
Valves of nickel steel.
Inlet and exhaust valves exactly alike.
Piston and piston rings cast iron.
Seats of exhaust valve, water cooled.
Runs on crude oil, solar oil, or gas oil.
Cylinders of bronze (composition).

The motor boats in which these engines are installed are of the ordinary type, resembling our 50-foot steamers more than they do the British steam pinnaces.

The engine room is about 12 feet long over all; the engines about 9 feet long; a very compact installation. Accessibility to engines very good on both sides.

Oil stowage in three galvanized tanks; one fore and aft on either side abreast after part of engine and one athwartships abaft engine and under break of cockpit.

The engine bearings and housings are comparatively light in construction, and the girder supports and saddles are quite similar to the general layout on ex-German submarine *U–135*, a sketch of which was submitted to the department in 1919 with the American officers' report on ex-German submarines. This comment applies to the system of installation and, of course, not to the size of scantlings.

It is evident from the engine supports in the boats that these engines are well balanced and smooth running; otherwise the foundations would be inadequate.

There were no new or novel features noted in hull design except the rocker keel which had a marked sheer up aft, there being little deadwood. The keel projected below the hull from 2 inches just forward of amidships to about 12 to 14 inches aft. The stern was V-shaped, as is quite common in our boats.

H. M. SUBMARINE "U–135."

NOTES ON CAPACITY AND BEHAVIOR OF BATTERIES.

Source: Reliable. **May 7, 1920.**

(13119)

Historical.

It is understood that on surrender *U–135* was a new boat and had never made a war cruise. It is therefore practically certain that the battery was also new and had not undergone much service.

The first recorded data of any kind was a density sheet from Nos. 2 and 3 batteries taken on December 12 and 13, 1918, within a month of the armistice. This showed densities varying between 1,170 and 1,200, which, considering that the battery was then in a low condition and had not undergone much service, would indicate that it was in fairly good condition even in density.

For six months the boat was kept lying alongside a depot ship at Harwich, during which time the battery was kept charged, but no records are available of its behavior. One half of No. 1 battery was used from time to time to supply lighting power to the depot ship, and consequently became uneven with the rest of the batteries, which was not rectified until September, 1919, when the method of dealing separately with half batteries was discovered.

On May 1, 1919, the boat was commissioned by a British crew, and from that time battery records were kept and from which these notes are compiled.

On May 23–24 the boat proceeded from Harwich to Blyth.

During the first few months after commissioning no great attention was given to the batteries owing to the great deal of time necessarily devoted to investigations and trials of other parts of the boat and to the lack of the necessary personnel. Beyond periodical inspection and topping up and the recording of charges, no other battery work was done until September, 1919, when, as already stated, they were leveled off by discharging one half of No. 1 battery to equalize it with the other half. More time was devoted to battery work after this.

One coil of No. 1 battery had to be cut out about this time owing to the container being cracked.

During all this time the batteries were in constant use for innumerable trials at sea and in harbor with the exception of three weeks in June when the boat was in dock at Blyth, where they were run down and may possibly have become slightly sulphated. Their subsequent behavior indicated that no damage had resulted.

Toward the end of November, 1919, the boat proceeded from Blyth to Plymouth, where she carried out a series of official trials during January, 1920.

Charging and Temperature.

With the exception of a few occasions when on passage, etc., charging has always been done with the auxiliary engines, and as one of the charging dynamos was seriously damaged soon after surrender, only one has been available, and in consequence the charging has always been done at a low rate, usually 300 to 400 ampers per battery.

With ventilating fans running, no appreciable rise of temperature has been experienced at any time, even in summer, but in hot cli-

mates attention would undoubtedly have to be paid to battery temperature when charging at a fairly high rate. The arrangement of separate ventilation to every cell with individual adjustment by gauges for every group of cells served by one collector provides very even control of temperature over the whole battery and no portion appears to be less well ventilated than the remainder. The rise of density during charge appears to follow the same laws as that of British batteries in that it rises slowly at first and much more rapidly during the middle portion of a charge.

As a general rule during charging, the rate was regulated by the voltage, and was reduced on attaining about 335 volts, or 2.7 per cell, the final stages after densities had ceased to rise being governed by considerations of temperature as well.

From observations of the recorded input during various charges the estimated number of ampere hours which could be put into the batteries was 15,000.

Individual Cell Voltages.

Individual cell voltages were recorded throughout the batteries on December 31, 1919, showing that no cells were in any way abnormal, the voltages only ranging between 2.05 and 2.10.

Density Sheets.

Density sheets were taken at varying intervals and show that the evenness of densities became somewhat less regular after the battery had been much used. For comparative purposes the results of two records are shown:

	Mean density.	Greatest variation from mean.	Average variation from mean.
Oct. 3, 1919	1,232	22	4.65
Feb. 10, 1920	1,240	25	6.53

Capacity and Efficiency.

Two battery discharges were carefully recorded to arrive at a figure for the capacity. The first record was during a long dive on January 5, 1920, when due to constant variations of speed on the motors, etc., it was difficult to obtain very exact records.

The result worked out at 14,310 ampere hours or 4,770 ampere hours per battery.

This result is probably slightly overestimated and judging from the condition of the cells at the end of this discharge which lasted at varying rates for eight hours, it may be deduced that the battery was capable of at least 15,000 ampere hours capacity at a low rate of discharge.

The second recorded discharge was carried out by running the main motors alongside the depot ship on January 20, 1920. Before commencing this discharge the batteries were well charged up until all densities had ceased to rise for two at a final rate of 300 amperes (100 amperes per battery).

The attached tabular statement shows the records taken and results deduced.

It will be observed that the records begin at the moment of breaking the charge on January 19 and end at the commencement of the charge on January 20.

The discharge on main motors was continued until the voltage began to fall rapidly and the electric lights burnt low.

The results may be considered as applicable to the 4½-hour rate of the batteries and as such show a somewhat higher capacity than British batteries.

The densities, however, appear to fall very low, which would indicate that a greater range is permissible in these batteries than is the practice in British batteries. The average hourly reduction in density during the principal stages of the discharge was about 40 points.

On recharging the batteries they were brought up as nearly as possible to the same condition as they were at the commencement of the discharge in order to obtain the input and deduce a figure for the efficiency, which is high, and would probably be greater still at a lower rate of discharge.

Temperatures kept well down throughout the discharge and battery fans were kept running continuously. During the last hour there was a slightly increased rate in the rise of temperature.

Submerged Endurance, etc.

From measured mile records submerged combined with the results of battery observations, the undermentioned table gives an estimate of the submerged endurance.

Rate of discharge of main motors (amperes).	Estimated total capacity of batteries (ampere hours.)	Endurance (hours).	Speed (knots).	Radius (nautical miles).	75 per cent radius taken as possible, allowing for expenditure of battery power on auxiliary purpose.
Emergency full speed, 7,000 (1,750 on each)	13,500	1.93	[1]	[1]	.....
Normal full speed, 5,800 (1,450 on each)	14,000	2.4	7.06	16.94	12.7
Motors in parallel slow, 3,000 (750 on each)	14,200	4.7	5.56	26.13	19.59
Motors in series 1,000 (500 on each)	14,500	14.5	[2] 2.75	[2] 39.87	29.91

[1] Not obtained. [2] Estimated.

PROPELLER SHAFT PROTECTION—GERMAN PRACTICE.

Source: Reliable. **May 12, 1920.**

(13183)

Two ex-German merchant ships and four ex-German men-of-war have recently been docked at Rosyth Dockyard. An examination of the propeller shafts of these vessels indicated that a form of protection had been applied to the shafts from the stern gland to the hub; this protection consisted of winding the shafting with fine wire over which was installed a matrix of india rubber. When this rubber and wire matrix was removed, the shafting appeared to be in perfect condition and no signs of pitting were found underneath.

An effort will be made to obtain further information on this subject in order to determine the method of application and the materials used.

GERMAN HIGH-POWER TURBINE GAS ENGINE.

Source: Reliable. **May 10, 1920.**

(13146)

It has been reported that *Theissen*, of Mulheim, Germany, has been experimenting secretly for two years on turbine gas engines of high power and has recently perfected a vertical turbine of 10,000 horsepower. Its greatest diameter is stated to be 5 feet. The German (Government) railroads are stated to have ordered two of these turbines for experimental use (with electric lines) with a view to reducing coal consumption.

Efforts are being made to obtain particulars.

OPERATIONS.

CHARACTERISTICS, ACTIVITIES, AND NUMBER OF JAPANESE TROOPS IN SIBERIA.

Sources: Reliable. **April 15, 1920**

(13193)

For several months the writer has had an opportunity of observing the Japanese forces in Vladivostok and immediate vicinity and has reached the following conclusions:

Total Strength of Japanese Forces.

Reports have been received from United States Army Intelligence officers, paid agents, consular representatives, Russian Railway Service Corps officials, and others regarding the number of Japanese troops in Siberia. It has been impossible to obtain an exact and reliable figure as even the Japanese themselves have been unable to furnish the desired information or perhaps have not wished to divulge their actual strength. After considering the above-mentioned reports it is believed that 67,000 is an approximately correct estimate, which includes all branches of the Japanese Army which are at present in Siberia.

Discipline.

The discipline of Japanese troops appears to be excellent. The individual soldier has been trained to act exactly as he is instructed to and will carry out his orders exactly as he receives them but seldom displays any initiative or intelligence regarding the execution of the mission which has been assigned to him. He is not instructed to bear in mind the will of the person giving the orders and to conduct himself so as to best carry that desire into effect, but only to execute the order exactly and precisely as he receives it. In this respect he closely resembles the German soldier which is quite natural as many of the methods of training and discipline used in the Japanese Army are closely patterned after those employed by the Germans. Apparently little or no attempt has been made to instruct the Japanese soldier in showing any military courtesy to any except Japanese officers. This has caused considerable comment among the Allies represented in Vladivostok.

Equipment.

All branches of the Japanese forces appear to have excellent equipment and it is kept in the best possible condition. One exception to this has been noticed to be the cavalry horses which are at present

in Vladivostok. There appears to be no standard size of these horses and this fact is impressed on any observer who has had the opportunity of seeing a squadron of Japanese Cavalry. The horses range from 14 hands and 3 inches to 16 hands but the majority might be said to be about 15 hands and 2 inches. The cavalry are equipped with a carbine about the same length as those previously used by our own cavalry and has a bayonet attached which folds back along the lower side of the stock when not in use. The uniform worn by Japanese soldiers is made of a very durable yellowish-tan colored cloth which it is said has proven very satisfactory. The uniform worn by the soldier seems to receive less attention than the other articles of his equipment and usually is worn in a sloppy manner and frequently is quite dirty.

Small Arms Instructions.

Considerably less effort is devoted to developing the individual Japanese soldier in a good rifle shot than is the custom in our own service. It is not believed that any small-arms practice has been held by the Japanese forces in any part of Siberia. The fact that the majority of Japanese soldiers are comparatively poor shots has been clearly demonstrated in several skirminishes they have had with the Russians in street fighting at close range during which Japanese fire has many times inflicted small damage when one considers the close proximity and size of the target.

Morale.

In general the morale is very good. Wherever the Japanese soldiers are seen there are also to be seen the well-known geisha houses in which he spends most of his time when off duty. This is encouraged by the Japanese who set aside some houses for the officers and some for the men. It is known that in one locality at least passes have been issued to the soldiers which enable them to visit one of these houses and receive food and listen to the music for a period of approximately two hours.

Designations of Organizations.

The Japanese soldier does not wear any device or number on his uniform by which one may tell to what organization he belongs, but instead carries a small tag on which is his name, regiment, and company and which he wears either around his neck or under his arm.

Endurance.

Japanese Infantry has demonstrated that it can not keep up with United States Infantry on a long march. The Japanese move slower and require longer rests. One explanation of this fact lies in the theory that the foot muscles of the Japanese are not developed as they should be, due to the type of shoes worn in Japan which cause the wearer to shuffle along instead of raising up on the toe of his foot at each step.

Relations Between Officers and Men.

The attitude of the Japanese officers toward their men is very much like that of the German officers and not at all like that of our own officers. This was best illustrated by an incident which came under my personal observation. A pulling boat quite heavily laden and containing three Japanese officers and 10 soldiers started for the beach but owing to the amount of water it drew could not get to a landing place. This made it impossible for the officers to get ashore without stepping into the water. In order to overcome this difficulty the soldiers who were fully equipped were ordered into the water which was slightly more than knee deep and made to carry the boat and the three officers to the water's edge, which was about 30 yards distant. This incident is typical and precisely demonstrates how the Japanese officers feel toward their enlisted men.

Much has been heard recently regarding the probability of the Japanese forces evacuating Siberia, but nothing is definitely known as yet. The feeling among the Russians is constantly becoming more bitter against the Japanese, who even admit this themselves.

No definite policy has been given out by Japan regarding Siberia. On 17 February, 1920, Premier Hara stated in the House of Peers that no policy could be decided upon until the attitude of the Allies was more clearly defined. He also said that the date of evacuation of the Japanese forces remained uncertain, due to the unsettled conditions in Siberia. This last statement practically means that the Japanese have no idea of leaving Siberia in the very near future.

Lieut. Gen. Inagaki, chief of staff of the Japanese forces in Siberia, recently stated that his personal views regarding the Japanese policy in Siberia were as follows:

(*a*) The Japanese would not oppose the Bolshevik advance eastward.

(*b*) No political changes would be opposed.

(*c*) Japanese forces would only fight if they were attacked.

He also stated that in his opinion only two courses of action were open to Japan. The first is complete evacuation. The second is to assume complete control of the area it is decided to hold, which action would be necessitated by the pronounced anti-Japanese feeling existing at present, and which would involve large forces and expenditures.

PLANS FOR HARBOR IMPROVEMENTS.

Source: Reliable. **April 19, 1920.**

(13165)

Present plans for harbor improvements at Yokohama are for an eight-year period. The cost is estimated at about yen 15,000,000 ($7,477,500), which includes the following major charges:

	Yen	
Building quays	4,077,400	($2,032,583.90)
Building breakwater	1,523,600	(759,514.60)
Building four bridges (one railway and three public)	984,000	(490,524.00)
Purchasing machinery for construction work, etc	2,000,000	(997,000.00)
Reclamation work	1,809,000	(901,786.50)

The quays are to be built and the harbor deepened, with attention to the proposed shape of the reclaimed land, the conformity of the shore line, and ease of connection with both land and water, so as to accommodate 12 ships alongside at the same time, varying from 5,000 to 50,000 gross tons, or a total of 150,000 gross tons.

Other quays will later be built along each side of the new breakwater which is to be built from near Tsurumi, across from Yokohama, when conditions warrant an extensive enlargement of the harbor. This, however, will probably not be incorporated in the present or third harbor extension plans.

There is to be a length of 1,020 dockage feet alongisde these quays for vessels of 40 feet draught. For ships of 35 feet draft, 720 feet of dockage will be provided, while vessels of 30 and 25 feet draft can be accommodated anywhere alongside these quays.

The breakwater, which will probably be built later, is to have an outside length measurement of 2,958 feet and an inside length measurement of 2,688 feet.

The reclamation work will cover about 100,500 tsubo (82.96 acres). The depth of the fill is to be 24 feet.

The total area to be dredged to varying depths for the vessels of different drafts as outlined above is 221.3744 acres (this includes a considerable area, definite plans for which probably will not be incorporated in the third harbor extension plans).

The plan as outlined above is the result of the steadily increasing number of ships and the volume of freight handled in the Yokohoma Harbor.

When the present harbor works were completed, some time before the war, the record annual number of ships was 426, with a total of 1,360,000 gross tons, and the volume of freight handled was 470,000 tons.

In 1918 the number of vessels had increased to 667, with a total of 2,260,000 gross tons and a freight volume of about 630,000 tons.

In 1919, 1,188 ships were entered at Yokohama, totaling 4,444,893 gross tons.

Details of the third harbor extension plan, giving a comparison with the present harbor facilities, are:

	Present harbor facilities.	Proposed third harbor extension facilities.
Area of reclaimed land.....acres..	56. 9594	82. 0964
Quays and piers:		
(1) Total length.....feet..	6, 786	8, 298
(2) Dockage.....do....	5, 706	6, 978
(3) Depth alongside (at ebb tide):		
(*a*) Maximum.....feet..	32	40
(*b*) Minimum.....do....	20	25
Number of vessels that may dock at the same time....	13	12
Tonnage class of ships that can dock.....tons..	3, 000–15, 000	5, 000–50, 000
Total tonnage that can be accommodated at quays or piers at one time.....gross tons..	85, 000	150, 000

It is planned to have the most modern harbor equipment of any port in the Orient. The tentative appropriation for harbor equipment has not as yet been made. But as such, it will be distinct from the item for machinery herein mentioned.

The above plans are completed, and will be presented to the Imperial Diet probably in June of this year. It is hoped that the central Government will bear half of the expense, while the Yokohama municipality is planning on raising the remainder probably by long term, 5 per cent municipal bonds, at a selling price of 96.

If possible, the harbor work will commence some time in July or August, under the supervision of the Yokohama municipality public works.

Tokyo is also planning to build a large harbor at an estimated outlay of yen 350,000,000 ($174,475,000), spread over a 20-year period.

Funds therefore are to be raised somewhat in the manner indicated for the Yokohama Harbor.

It is proposed to divert the mouth of the Sumida River, as much silt is at present thereby brought down each year from the interior.

It is somewhat problematical whether the future prosperity of Tokyo and Yokohama can stand two large harbors only 18 miles apart.

H. M. S. "HOOD," TRIAL DATA.

Source: Reliable. **June 3, 1920.**

(12408)

Turbine conditions.	Shaft horsepower.	Steam consumption in pounds per shaft horsepower-hour.		Fuel consumption in pounds per shaft horsepower hour, total.
		Turbines only.	All purposes, total.	
Steam to cruising turbines. Closed exhaust only to after turbines.	8,944	.....	18.2	1.45
	9,184	14.5	.....	.....
	14,613	.....	15.27	1.26
	14,757	12.21	.....	.....
	19,772	.....	13.73	1.17
Steam to cruising turbines. Closed exhaust with steam to forward high-pressure turbines.	26,153	11.3	.....	.....
	28,131	.....	13.06	1.10
Steam to cruising turbines and to after high-pressure turbines. Equalpowers on all shafts.	24,722	13.24	.....	.....
	35,752	11.94	.....	.....
	36,010	.....	13.6	1.14
All main turbines in use at equal powers.	28,702	13.4	.....	.....
	29,210	.....	15.6	1.26
	57,788	11.72	.....	.....
	57,977	.....	13.01	1.06
	86,102	11.12	.....	.....
	87,729	.....	12.39	1.00
	115,294	11.1	.....	.....
	115,294	.....	.....	.....
	115,456	.....	12.42	1.07
	144,984	11.05	.....	.....
	150,473	.....	12.56	1.12

Measured Mile Trial Data.

	Displacement.	Speed (knots).	Shaft horsepower.	Revolutions per minute.
Legend	42,090	13.53	9,110	80
	41,700	15.60	14,630	93
	41,700	17.20	20,050	103
	41,600	20.37	29,090	124
	41,850	25.24	58,020	154
	42,100	27.77	89,010	176
	42,150	29.71	116,150	191
	42,200	32.07	151,280	207
Deep	45,000	13.17	8,735	81
	45,000	15.78	14,020	96
	45,000	19.11	24,720	116
	44,600	22.00	40,780	136
	44,600	25.73	69,010	161
	44,600	28.37	112,480	185
	44,600	31.89	150,220	204

Legend displacement, 1,200 tons oil fuel.
Deep displacement, 4,000 tons oil fuel.

INFORMATION REGARDING THE TRIALS OF H. M. S. "COURAGEOUS."

Source: Reliable. **May 20, 1920.**

(6792)

On May 13, 1920, the Admiralty furnished the following information to the results of the trials of H. M. S. *Glorious*, *Courageous*, and *Furious*.

In forwarding this data the Admiralty letter stated: "I may state that during the war period trials were of short duration, and the trial data are therefore scanty as compared with those of ordinary times."

Results of Trials.

H. M. S. "Glorious."

Displacement in tons	21, 670	21, 670	21, 670	21, 300
Shaft horsepower	20, 800	39, 250	76, 700	91, 150
Revolutions per minute	205	254	313	330
Speed in knots	20. 15	24. 45	29. 85	31. 4

H. M. S. "Courageous" and H. M. S. "Furious."

Displacement in tons	[1]	22, 100
Shaft horsepower	93, 570	90. 800
Revolutions per minute	321	324
Speed in knots	[2]	[3] 30. 8

[1] Not recorded. [2] Not taken. [3] Not taken; by log.

British Navy July 1, 1920.

[Abbreviations: (O. S.), officially reported for sale; information taken from official Admiralty publications (U. S.), unofficially reported to be for sale; information taken from newspapers and periodicals.]

BATTLESHIPS.

Modern:
- Royal Sovereign.
- Ramilles.
- Revenge.
- Malaya.
- Resolution.
- Barham.
- Royal Oak.
- Valiant.
- Emperor of India.
- Warspite.
- Benbow.
- Queen Elizabeth.
- Erin.
- Marlborough.
- Iron Duke.
- Ajax.
- Centurion.
- King George.
- Conqueror.
- Monarch.
- Thunderer.
- Orion.

Obsolete:
- Agincourt.
- Hercules (U. S.).

Obsolete—Continued.
- Colosus (U. S.).
- Neptune (U. S.).
- Collingwood (U. S.).
- St. Vincent (U. S.).
- Superb (U. S.).
- Temeraire (U. S.).
- Bellerophon (U. S.).
- Dreadnought (U. S.).
- Lord Nelson.
- Agamemnon.
- Hibernia (U. S.).
- Africa (U. S.).
- Zulandia (U. S.).
- Hindustan (U. S.).
- Dominion (U. S.).
- Commonwealth (U. S.).
- Swiftsure (U. S.).
- Prince of Wales (O. S.).
- Queen (U. S.).
- Exmouth (O. S.).
- Duncan (O. S.).
- Albermarle (O. S.).
- And 14 older ones; 5 of the 14 old ones are officially reported for sale.

FLOTILLA LEADERS.

Modern:
- Keppel.
- Rooke.
- Wallace.
- Mackay.
- Malcolm.
- Campbell.
- Stuart.
- Montrose.
- Douglas.
- Bruce.
- Spencer.
- Shakespeare.
- Anzac.
- Saumarez.

Obsolete:
- Seymour.
- Grenville.
- Parker.
- Ithuriel.
- Gabriel.
- Abdiel.
- Lightfoot.
- Kempenfelt.
- Marksman.
- Nimrod.
- Botha.
- Faulknor.
- Broke.
- Swift.

AIRCRAFT CARRIERS.

Modern:
- Eagle.
- Vindictive.
- Furious.

Modern—Continued.
- Hermes.
- Argus.
- Ark Royal.

British Navy, July 1, 1920—Continued.

BATTLE CRUISERS.

Modern:
- Hood.
- Renown.
- Repulse.
- Tiger.
- Princess Royal.
- Lion.

Obsolete:
- New Zealand.[1]
- Australia.[1]
- Inflexible (U. S.).
- Indomitable (U. S.).

DESTROYERS.

Modern:
- R class, 49.
- S class, 59.
- V class, 64.
- M class, 86.
- L class, 19.
- K class, 13.
- Ex Turkish, 3.
- Ex Greek, 3.

Obsolete:
- I class, 20.
- H class, 17.
- G class, 13.
- F class, 9.
- E class, 27.
- D class, 7.
- C class, 27.
- B class, 18.
- A class, 6.
- Parramatta class, 60.

Officially marked for sale:
- K class, 1.
- L class, 1.
- M class, 4.
- G class, 12.
- F class, 2.
- E class, 6.
- D class, 4.
- C class, 8.
- B class, 11.
- A class, 4.
- Ex Greek, 1.

Unofficially marked for sale:
- All of F class.

SUBMARINES.

Modern:
- R class, 11.
- M class, 4.
- L class, 41.
- K class, 14.
- H class, 30.
- G class, 10.
- V class, 4.
- J class, 6.

Obsolete:
- CC class, 2.
- N class, 1.
- C class, 27.
- D class, 3.
- E class, 29.
- F class, 3.
- B class, 1.

Unofficially reported for sale:
- K class, some.
- H class, all.
- G class, 3.
- E class, most.
- R class, all.
- B class, most.
- C class, most.
- D class, most.
- V class, 2 (V3, V4).

LIGHT CRUISERS.

Modern:
- Emerald.
- Enterprise.
- Euphrates.
- Despatch.
- Diomede.
- Raleigh.
- Effingham.
- Frobisher.
- Durban.
- Delhi.
- Dunedin.
- Hawkins.
- Colombo.
- Calcutta.
- Capetown.
- Cairo.
- Carlisle.
- Dauntless.
- Danae.
- Dragon.
- Coventry.
- Curlew.
- Curacoa.
- Cardiff.
- Ceres.
- Calypso.

[1] May be transferred to Dominions.

British Navy; July 1, 1920—Continued.

BATTLE CRUISERS—continued.

Modern—Continuen.	Modern—Continued.
Caradoc.	Bristol.
Concord.	Newcastle.
Caledon.	Liverpool.
Cambrian.	Gloucester.
Centaur.	Glasgow.
Canterbury.	Melbourne.
Chester.	Sydney.
Constance.	Brisbane.
Castor.	Adelaide.
Champion.	Obsolete:
Conquest.	Fearless (O. S.).
Birkenhead.	Active (O. S.).
Cleopatra.	Blond (O. S.).
Royalist.	Blanche (O. S.).
Calliope.	Bellona (O. S.).
Comus.	Broadicea (U. S.).
Carysfort.	Skirmisher (U. S.).
Phaeton.	Attentive (O. S.).
Caroline.	Patrol (U. S.).
Penelope.	Foresight (U. S.).
Inconstant.	Adventure (U. S.).
Galatea.	Forward (O. S.).
Undaunted.	Sentinel (U. S.).
Cordelia.	Sapphire (U. S.).
Aurora.	Diamond (U. S.).
Birmingham.	Amethyst (O. S.).
Lowestoft.	Topaze (U. S.).
Chatham.	Challenger (U. S.).
Southampton.	Encounter (U. S.).
Dublin.	And 19 older ones; 4 of the 19 older vessels are officially reported for sale and the remaining 15 are unofficially reported for sale.
Yarmouth.	
Dartmouth.	
Weymouth.	

Dates for completion of vessels.

JUNE 25, 1920.

BATTLESHIPS.

New Jersey [1]	Boston	Indefinite.	Nebraska [4]	Mare Island	Not set.
Virginia [1]	do	Do.	Rhode Island [5]	do	Do.
Tennessee	New York	Aug. 1.	Vermont [5]	do	Do.
Louisiana [2]	Philadelphia	Indefinite.	Texas	Puget Sound	Indefinite.
Georgia [3]	Mare Island	Not set.			

CRUSIERS AND GUNBOATS.

Huntington [1]	Portsmouth	Indefinite.	Charleston	Puget Sound	Not set.
Chester (res.)	Boston	Do.	Missoula (ex Montana).	do	Do.
Frederick	Philadelphia	June 25.	Charlotte (ex North Carolina).	do	Do.
Pueblo [1]	do	Not set.	Seattle	do	Do.
St. Louis	do	Do.			
Denver	Mare Island	Indefinite.			

[1] To be placed out of commission.
[2] To be placed out of commission about Aug. 15.
[3] To be placed out of commission about June 29.
[4] To be placed out of commission about June 18.
[5] To be placed out of commission about June 30.

Dates for completion of vessels—Continued.

DESTROYERS.

Fairfax (res.)	Portsmouth	July 1.	Sampson (res.)	New York	Indefinite.
Gridley (res.)	do	July 10.	Sharkey (res.)	do	Do.
Israel (res.)	do	Indefinite.	A. P. Upshur	Norfolk	Do.
Lark	do	Aug. 8.	Balch (res.)	do	Do.
Mallard	do	Do.	Benham (res.)	do	Do.
McKee (res.)	do	Indefinite.	Branch (fit. out)	do	Do.
Ringgold (res.)	do	Do.	Connor (res.)	do	Do.
Robinson (res.)	do	Do.	Dallas (fit. out)	do	Do.
Stevens	do	Do.	Downes (res.)	do	Do.
Taylor	do	Do.	Duncan (res.)	do	Do.
Ausburne (fit. out)	Boston	Ready.	Herndon (fit. out)	do	Do.
Conyngham (res.)	do	Indefinite.	Hunt (fit. out)	do	Do.
Cowell (res.)	do	Do.	Parker (res.)	do	Do.
Foote (res.)	do	Do.	Aaron Ward	Mare Island	Do.
Kalk (res.)	do	Do.	Buchanan	do	Do.
Kimberly (res.)	do	Do.	Evans	do	Do.
Lardner (res.)	do	Do.	Kilty	do	Do.
Luce (res.)	do	Do.	Mugford	do	Do.
Maddox (res.)	do	Do.	Philip	do	Do.
Mahan	do	Aug. 8.	Wickes	do	Do.
Meredith (res.)	do	Indefinite.	Woolsey	do	Do.
Murray	do	Aug. 8.	Dent (res.)	Puget Sound	Do.
Osbourne (res.)	do	Indefinite.	Dorsey (res.)	do	Do.
Caldwell (res.)	New York	Do.	Edwards (res.)	do	Do.
Dyer (res.)	do	Do.	Rathburne (res.)	do	Do.
Gregory (res.)	do	Do.	Talbot (res.)	do	Do.
McDougal (res.)	do	Do.	Waters (res.)	do	Do.
Morris	do	Do.			

SUBMARINES AND SUBMARINE TENDERS.

S-3	Portsmouth	Indefinite.	S-2	New York	June 30.
O-3	Boston	July 3.	K-1, 2, 3, 4, 5, 6, 7, 8	Philadelphia	Indefinite.
O-5	do	Do.	Eagle No. 17	Norfolk	Do.
Rainbow	do	Sept. 15.	L-3, 9	do	Do.
Savannah	do	Indefinite.	L-6	Mare Island	Do.
R-7	New York	July 12.			

FLEET TENDERS (Train).

Rappahannock (res.)	Portsmouth	Oct. 1.	Brutus	Mare Island	Indefinite.
Bridgeport	Boston	Aug. 1.	Comfort (ord.)	do	Do.
Teal	Charleston	Indefinite.	Robin	New York	Do.

MINE FORCE.

IN COMMISSION.

Baltimore, Mare Island, indefinite.

IN RESERVE.

Auk	Portsmouth	Indefinite.	Penguin	Norfolk	June 25.
Chewink	do	Do.	Sanderling	Charleston	June 26.
Curlew	do	Do.	Tanager	do	July 12.
Flamingo	do	Do.	Turkey	do	Do.
Grebe	do	Do.	Whippoorwill	do	Indefinite.
Osprey	do	Do.	Widgeon	do	Do.
Woodcock	do	Do.	Pigeon	Mare Island	Do.

MISCELLANEOUS.

Patuxent	Portsmouth	Indefinite.	Conestoga	Norfolk	Indefinite.
Algorma	New York	Do.	Jupiter	do	Do.
Nokomis	do	Do.	Allegheny	New Orleans	June 26.
Sagamore	do	Do.	Navajo	Pearl Harbor	Indefinite.
Hannibal (res.)	Philadelphia	Do.			

Dates for completion of vessels—Continued.

N. O. T. S.

Caesar	Norfolk	Indefinite.	Nero	Charleston	July 24.
Gulfport	do	June 26.	Newport News	Mare Island	July 10.
Mars	do	June 25.	Bath	Puget Sound	July 15.
Kittery	Charleston	June 30.			

EAGLE BOATS.

Eagles Nos. 6, 7, 8, 10, 12, 34, 35, 38, 47, and 58, Portsmouth, July 1.

JUNE 18, 1920.

OTHER GOVERNMENT DEPARTMENTS.

U. S. ARMY.

Gen. Schofield	Portsmouth	Indefinite.	New Orleans	New Orleans	June 26.
Donovan	New Orleans	Do.			

U. S. SHIPPING BOARD.

Otsego	Portsmouth	Indefinite.	Susquehanna	New York	June 26.
Peacock	do	Do.	Warbler	Philadelphia	Indefinite.
Black Arrow	Boston	Do.	Willet	do	Do.
Geo. Washington	Do	June 30.	Comstock	New Orleans	Do.
Agamemnon	New York	Indefinite.	Orion	do	Do.
Chatauqua	do	Do.	Sequoia	Mare Island	Do.
Lake Deval	do	Do.			

BATTLESHIPS OUT OF COMMISSION.

Coast B. S. No. 1 [6]	Philadelphia.	Coast B. S. No. 4 [6]	Philadelphia.
Coast B. S. No. 2 [6]	Do.	Missouri [6]	Do.
Illinois [6]	Do.	Maine [6]	Do.
Kentucky [6]	Do.		

BATTLESHIPS UNDER REDUCED COMMISSION.

AT PHILADELPHIA.

Alabama.[7]	Kearsarge.[7]	Louisiana.[7]
Kansas.[8]	Kentucky.[7]	Wisconsin.[7]

CRUISERS, GUNBOATS, AND MISCELLANEOUS OUT OF COMMISSION.

Dubuque [9]	Portsmouth.	Tallahassee	Charleston.
Paducah [9]	Do.	Topeka	Do.
Isabel	Philadelphia.	Monadnock [10]	Olongapo.
Ozark [6]	Do.	Castine [10]	New Orleans.
Tonopah [6]	Do.	Cincinnati [10]	Do.
Yankton [10]	Do.	Petrel [10]	Do.
Jupiter [11]	Norfolk.	Wheeling	Do.
Standish [10]	Do.	Bay Ocean [10]	Mare sland.
Wasp [10]	Do.	Machias [10]	Do.
Winchester [10]	Do.	Marblehead [6]	Do.
Nashville [6]	Charleston.	Supply	Do.
Raleigh [10]	Do.	Yorktown [10]	Do.

TORPEDO BOATS OUT OF COMMISSION.

CTB No. 1 (Foote) [6,10]	Philadelphia.	CTB No. 9 (Somers) [6,10]	Philadelphia.
CTB No. 2 (Rodgers) [6,10]	Do.	CTB No. 11 (Barney) [6,10]	Do.
CTB No. 3 (Dupont) [6, 0]	Do.	CTB No. 12 (Biddle) [6,10]	Do.
CTB No. 4 (Dahlgren) [6,10]	Do.	CTB No. 14 (Delong) [6,10]	Do.
CTB No. 6 (Morris) [6]	Newport.	CTB No. 16 (Thornton) [6,10]	Norfolk.

[6] No work being done.
[7] To be placed out of commission.
[8] Repairs completed.
[9] General repairs.
[10] To be sold.
[11] Conversion into aeroplane carrier.

EAGLE BOATS IN ORDINARY.

At Portsmouth.

Eagle No. 2.	Eagle No. 24.	Eagle No. 41.	Eagle No. 52.
Eagle No. 3.	Eagle No. 26.	Eagle No. 42.	Eagle No. 54.[12]
Eagle No. 5.	Eagle No. 27.	Eagle No. 44.	Eagle No. 55.
Eagle No. 9.	Eagle No. 28.	Eagle No. 45.	Eagle No. 56.[12]
Eagle No. 13.	Eagle No. 29.	Eagle No. 46.[12]	Eagle No. 59.
Eagle No. 18.	Eagle No. 36.	Eagle No. 48.	
Eagle No. 19.	Eagle No. 37.	Eagle No. 50.	
Eagle No. 23.[12]	Eagle No. 39.	Eagle No. 51.	

SUBMARINES OUT OF COMMISSION.

U-117 [13]	Philadelphia.	UB-88 [13]	San Pedro.
U-140 [13]	Do.	U-111 [13]	Portsmouth.
UB-148 [13]	Do.	A-2, 4, 6, 7 [10]	Cavite.
G-1 [14]	Do.	B-2 [10]	Do.
UC-97 [13]	Chicago.		

SUBMARINES AND SUBMARINE TENDERS IN RESERVE.

D-1, 2, 3 [15]	New London.	K-1, 2, 3, 4, 5, 6, 7, and 8 [16]	Philadelphia.
Eagle No. 33	Do.	E-1 and 2	Hampton Roads.
Fulton	Do.	Eagle No. 17	Do.
G-3 [15]	Do.	L-1, 2, 3, 4, 9, 10, 11	Do.
N-1, 2, 3, 4, 5, 6, 7 [15]	Do.	M-1	
Rainbow [16]	Boston.	F-2, 3 [17]	San Pedro.
Eagle No. 25	Philadelphia.		

SUBMARINES IN ORDINARY.

A-3, 5 [6]	Cavite, P. I.	B-3 [6]	Cavite, P. I.

VESSELS TO BE PLACED OUT OF COMMISSION IN NEAR FUTURE.

Warbler	Philadelphia.	Quiros [10]	Asiatic station.
Elcano [10]	Asiatic station.	Samar [10]	Do.
Pampanga [10]	Do.	Villalobos [10]	Do.

REDUCED COMMISSION OR ORDINARY.

Rappahannock [9]	Portsmouth.	Hannibal [9]	Philadelphia.
Chester [9]	Boston.	Comfort [9]	Mare Island.
Caesar [9]	Norfolk.		

DESTROYERS OUT OF COMMISSION.

At Philadelphia.

Ammen.	Jarvis.	Patterson.	Trippe.
Beale.	Jenkins.	Paulding.	Walke.
Burrows.	Jouett.	Perkins.	Warrington.
Drayton.	Mayrant.	Roe.	
Fanning.	McCall.	Sterrett.	
Henley.	Monaghan.	Terry.	

OLD DESTROYERS OUT OF COMMISSION AND BEING SOLD.

At Philadelphia.

Hopkins. Smith.

[6] No work being done.
[9] General repairs.
[10] To be sold.
[12] In full commission.
[13] Being dismantled.
[14] Target for depth-charge experiments.
[15] S/M school, experimental, and development work.
[16] Under repairs.
[17] Elemental S/M school work.

Summary by navy yards of ships under repair.

PORTSMOUTH, N. H.	
Huntington	Indefinite.
Fairfax (res.)	July 1.
Gridley (res.)	July 10.
Israel (res.)	Indefinite.
Lark	Aug. 8.
Mallard	Do.
McKee (res.)	Indefinite
Ringgold (res.)	Do.
Robinson (res.)	Do.
Stevens	Do.
Taylor (res.)	Do.
S-3	Do.
Rappahannock (res.)	Oct. 1.
Auk (res.)	Indefinite.
Chewink (res.)	Do.
Curlew (res.)	Do.
Flamingo (res.)	Do.
Grebe (res.)	Do.
Osprey (res.)	Do.
Woodcock (res.)	Do.
Patuxent	Do.
Eagles Nos. 6, 7, 8, 10, 12, 34, 35, 38, 47, and 58.	July 1.
General Schofield	Indefinite.
Otsego	Do.
Peacock	Do.
BOSTON.	
New Jersey	Indefinite.
Virginia	Do.
Chester (res.)	Do.
Ausburne (fit. out)	Ready.
Conyngham (res.)	Indefinite.
Cowell (res.)	Do.
Foote (res.)	Do.
Kalk (res.)	Do.
Kimberly (res.)	Do.
Lardner (res.)	Do.
Luce (res.)	Do.
Maddox (res.)	Do.
Mahan	Aug. 8.
Meredith (res.)	Indefinite.
Murray	Aug. 8.
Osbourne (res.)	Indefinite.
O-3	July 3.
O-5	Do.
Rainbow	Sept. 15.
Savannah	Indefinite.
Bridgeport	Do.
Black Arrow	Do.
George Washington	June 30.
Destroyers fitting out	
NEW YORK.	
Tennessee	Aug. 1.
Caldwell (res.)	Indefinite.
Dyer (res.)	Do.
Gregory (res.)	Do.
McDougal (res.)	Do.
Morris	Do.
Sampson (res.)	Do.
Sharkey (res.)	Do.
R-7	July 12.
S-2	June 30.
Robin (res.)	Indefinite.
Algorma	Do.
Nokomis	Do.
Sagamore	Do.
Agamemnon	Do.
Chatauqua	Do
Lake Deval	Do.
Susquehanna	June 26.
PHILADELPHIA.	
Louisiana	Indefinite.
Frederick	June 25.
Pueblo	Not set.
St. Louis	Do.
K-1, 2, 3, 4, 5, 6, 7, 8	Indefinite.
Hannibal (res.)	Do.
Warbler	Do.
Willet	Do.
Destroyers fitting out	
Iowa	July 15.
NORFOLK.	
Abel P. Upshur	Indefinite.
Balch (res.)	Do.
Benham (res.)	Do.
Branch (fit. out)	Do.
Connor (res.)	Do.
Dallas (fit. out)	Do.
Downes (res.)	Do.
Duncan (res.)	Do.
Herndon (fit. out)	Do.
Hunt (fit. out)	Do.
Parker (res.)	Do.
Eagle No. 17	Do.
L-3, 9	Do.
Penguin	June 25.
Conestoga	Indefinite.
Jupiter	Do.
Caesar	Do.
Gulfport	June 23.
Mars	Do.
Destrovers fitting out	
Other destroyers and submarines	
CHARLESTON.	
Teal	Indefinite.
Sanderling (res.)	June 26.
Tanager (res.)	July 12.
Turkey (res.)	Do.
Whippoorwill (res.)	Indefinite.
Widgeon (res.)	Do.
Kittery	June 30.
Nero	July 24.
Mine sweepers, Pacific Fleet	
Destroyers	
NEW ORLEANS.	
Allegheny	June 26.
Donovan	Indefinite.
New Orleans	June 26.
Comstock	Indefinite.
Orion	Do.
MARE ISLAND.	
Georgia	Not set.
Nebraska	Do.
Rhode Island	Do.
Vermont	Do.
Denver	Indefinite.
Aaron Ward	Do.
Buchanan	Do.
Evans	Do.
Kilty	Do.
Mugford	Do.
Philip	Do.
Wickes	Do.
Woolsey	Do.
L-6	Do.
Brutus	Do.
Comfort (ord.)	Do.
Baltimore	Do.
Pigeon (res.)	Do.
Newport News	July 10.
Sequoia	Indefinite.
PUGET SOUND.	
Texas	Indefinite.
Charleston	Not set.
Missoula (Ex-Montana.)	Do.
Charlotte (Ex-North Carolina.)	Do.
Seattle	Do.
Dent (res.)	Indefinite.
Dorsey (res.)	Do.
Edwards (res.)	Do.
Rathburne (res.)	Do.
Talbot (res.)	Do.
Waters (res.)	Do.
Bath	July 15.
PEARL HARBOR.	
Navajo	Indefinite.

[1] To be sent to this yard for work.

NOTE.—The number placed before the names of vessels indicates the order of priority.

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Washington, D. C.

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FOR CONVENIENCE IN ROUTING.

Officer.	Initials.	Date received.	Date forwarded.
Captain			
Executive Officer			
First Lieutenant			
Navigating Officer			
Gunnery Officer			
Communication Officer			
Engineer Officer			
Medical Officer			
Supply Officer			
First Division Officer			
Second Division Officer			
Third Division Officer			
Fourth Division Officer			
Fifth Division Officer			
Marine Officer			

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MISCELLANEOUS.

"THE GERMAN U-BOATS IN THE WAR, 1914–1918," BY KORVETTENKAPITÄN A. GAYER.

Korvettenkapitän A. Gayer was commander of the cruiser *Regensburg* and chief of the third U-boat flotilla and later chief of the U-boat department at the Admiralty.

Volume I is, unfortunately, incomplete, but is published as received because of its interest and being to a large extent the view of German submarine officers.

An effort is being made to obtain the other volumes, and they will be published if obtained.

Preface.

The following discussions, of which this volume is the first, do not represent an attempt to give a complete history of the German U-boat war. This will be left to a future official history.

It is very necessary that the general public, which has heard so much concerning the U-boat war from persons little acquainted with the subject, should be told a little more concerning that class of warfare that represented the concentrated effort of our Navy during the war, and in which extraordinary feats were performed.

As the author was chief of the third U-boat flotilla from the beginning of the war till January, 1918, and from January, 1918, until the end of the war he was in the U-boat department of the Admiralty, it is only natural that in the following pages the activities in the North Sea will be given prominence. For the same reason he is able to deal with the question of U-boat construction from an expert's point of view. The narrative will not deal with minor details; it will touch mainly upon those important phases of the U-boat war that were decisive.

The first volume deals with the period of U-boat attacks against warships and the beginning of the U-boat war against hostile mercantile vessels, according to the principles of the cruiser war, from the beginning of August, 1914, to the end of February, 1915, and finally the declaration of the U-boat blockade.

Four more volumes will follow. The second volume will deal with the U-boat blockade from 1915 to the end of the U-boat war against merchant vessels in the North Sea; that is, from February to October, 1915.

The third volume covers the period from winter 1915–16 to the beginning of the purely U-cruiser war, and the beginning of the ex-

clusive use of U-boats against hostile warships in the North Sea—i. e., October, 1915, to May, 1916. The fourth volume covers the period of the U-cruiser war from May, 1916, till February, 1917, and the period during which the North Sea U-boats were used against enemy war vessels—i. e., May to September, 1916. The fifth volume deals with the much-discussed unrestricted U-boat warfare, from February, 1917, to the end of the war.

It will be seen from the above that the subdivision of the material to be dealt with is fixed by the use to which the U-boats were put. The only exception is the period during which the U-boats had no definitely defined task, as the later accounts will show.

There are a number of reasons which prevent an immediate publication of all five volumes. We are, therefore, forced to limit ourselves for the moment to the first volume.

It is naturally impossible to discuss the U-boat war quite by itself, separated entirely from the other happenings on land and sea. We will occasionally be forced to discuss critical points of the war, especially concerning Germany and her allies, as well as the activities of the high sea fleet.

The author has tried to refrain from all criticism now that the war is over. When he criticizes the action taken by the leaders, or where he criticizes the important decisions, they will only be criticisms in the light of the knowledge available at the time.

From the Outbreak of the War to the Beginning of Independent U-boat Enterprises.

At the outbreak of the war all our U-boats were at Kiel; the boats which had just returned there from maneuvers were given leave and rest.

For immediate employment in the war only *U–5* to *U–25*, inclusive, were available. Of these only the boats from the *U–19* onward were fitted with really reliable engines (Diesels), the *U–23* and *U–25* had up to that date just carried out trial trips and their crews were not fully trained.

The *U–5* to *U–18* were fitted with Korting petrol engines. These boats experienced a great number of breakdowns, due to ignition troubles. During daylight these boats gave their position away because of their thick exhaust smoke; during darkness the engines misfired and the resulting flame and noise from the exhaust indicated their position.

The *U–5* to *U–25* (at the time the first and second U-boat flotilla) departed from Kiel together with the units of the High Sea Fleet that were there in August, 1914, for the North Sea; they arrived, with few exceptions, during the evening of the 1st of August at Heligoland.

The hope of the U-boat group was, as it was also that of the High Sea Fleet, to get in touch as soon as possible with the enemy. The maneuvers in May, 1914, had demonstrated that the U-boats should be very successful in such cooperation, even when pitted against superior forces. This disposition of the High Sea Fleet was made on the assumption that the English fleet would attempt to break into the German Bight. Almost without exception all strategic and tactical training of our U-boat flotilla had been based on this assumption. It was only within the last two years that it was realized that England would blockade the North Sea by a distant blockade. One event preceding England's declaration of war may be mentioned here. On the evening of the 1st of August, 1914, the commander of the High Sea Fleet sent out the signal, "Be in readiness for war against France and Russia; in the meantime avoid at all costs measures against British war and merchant vessels." Though the danger of England joining our opponents did not frighten any U-boat man, nevertheless the way in which this signal read showed us that we were in a politically uncertain situation, quite the opposite from the years 1866 and 1870, when Bismarck was perfectly certain as to the situation.

As an enemy attack was expected, the U-boats, together with the torpedo boats and mine sweepers, took up their positions near Heligoland. As the enemy was not inclined to enter the German bight except with his submarines, the first attack in the North Sea took place on the 6th of August. This attack was to ascertain if a blockade really existed; and if so, to learn the position of the blockading ships.

Thus began the first period of independent U-boat attacks, which lasted from the beginning of August, 1914, until February, 1915. During this time we attempted to weaken the enemy fleet by the U-boats alone.

The U-boat commanders were not very optimistic as to this type of warfare. The means of enticing enemy war vessels near the position of U-boats seemed to be lacking, and as the U-boats were slow, both submerged and on the surface, it seemed unlikely in most cases that they would be able to get close enough to fire a torpedo, even after sighting a ship. On the other hand, each commander understood the great value of such cruises from a scouting point of view, and all members of the crew were very proud to venture forth alone in these small boats against the enemy, with hopes of obtaining a hit with a torpedo. When the U-boats left the harbor or returned their crews made up almost entirely from volunteers who considered their comrades on the big ships as unfortunate.

The period of independent U-boat enterprises against warships and the first use of such boats against merchant vessels in accordance with the principles of the cruiser war was from the beginning of

August, 1914, until the end of February, 1915, when definite areas were closed.

At the beginning of this period the German general staff hoped to finish the war quickly and victoriously, as per plan of Graf von Schlieffen, which was based upon an early decision in the west, employing as many troops there as possible, whilst in the east the defensive was to be assumed until it became possible to employ troops from the west in the east for the decisive battle.

A victory was to be gained by the armies on land, whilst the fleet, with the exception of the U-boats, was to adopt a waiting attitude. The possibility of weakening or destroying the British fleet by the surprise attacks of our weaker but splendidly-trained fleet was not considered. What possibilities were lost only the future can tell. The plan of the high command, namely, to win on land only against allied forces, in which England was included, was without doubt a great error. A sea power like England could not be vanquished on the European Continent and forced to make peace. Furthermore, at the beginning of the war, when many things concerning naval matters, tactical as well as strategic, were obscure, the weaker fleet undoubtedly had better chances than at any later period of the war; especially so when one considers the tremendous power and material at the disposal of Great Britain, greater than our own by far. We know to-day from the writings of the British Admiral Jellicoe, who was at that time in command of the Grand Fleet, that during the first month of the war the British fleet was less superior and less ready than at any later date.

This discussion of the general plan of the war is necessary before considering the activities of the U-boats under this heading. It will be referred to again later.

The first sally of the U-boats was made from Heligoland toward a line drawn between Shetland and Bergen. This sortie was carried out in wide formation by the boats U–5 to U–18, i. e., the old petrol-engine boats. Several of these boats made contact with the enemy. The U–15, commanded by Kapitan Leutnant Pohle, torpedoed and damaged a large British battleship, but shortly after the attack was sunk by the light cruiser *Birmingham*. The U–13, commanded by Kapitan Leutnant Graf von Schwinitz, was lost, there being no information as to the cause of her loss.

A few days later the boats U–19 to 21, 22, and 24 were ordered to advance toward a line between Maas Lightship and Outer Gabbard Lightship. U–22 came close to the British destroyers on patrol, but nothing else of importance occurred.

These first cruises emphasized the necessity for numerous technical improvements in the U-boats. When a U-boat dived to hide

from the enemy the telephone and lifting buoys, which were safety appliances for peace conditions, became detached and rose to the surface, so they were removed. The bridge which was installed during peace time on the conning tower proved useless for war purposes; a new type of bridge was installed behind the conning tower. An alarm gear which would call the crew as quickly as possible to their diving stations when the enemy was sighted was also necessary. This was fitted in the form of loud alarm bells. The technical department supervising the U-boats building at Kiel studied all these suggestions with the greatest precision and adaptability.

A sally of the cruisers *Strasburg* and *Stralsund* into Hoofden (southern portion of North Sea) was made in the middle of August. They took two U-boats with them and gave battle to hostile destroyers, but the U-boats had no opportunity to attack.

The *U-21*, commanded by Kapitan Leutnant Hersing, carried out about this time a scouting cruise, which led past the south of Norway to the Moray Firth and to the Firth of Forth and enabled us to get information concerning the hostile coastal patrol service by torpedo-boat destroyers and armed trawlers. This U-boat covered 1,600 miles, which appeared then a record trip.

The first month of the war came to an end with similar undertakings and cruises by the U-boats. Besides meeting a few hostile submarines in the German bight that were scouting and had occasionally fired a torpedo that missed its mark, one noticed nothing of the enemy. This was the reason why the Admiralty sent out a daily order to the ships stating that the enemy apparently did not intend to make an entry into the German bight, but that he would probably delay doing so until the days became shorter. The rigid requirements for battle demanded of all our ships was accordingly somewhat eased; and some of the larger ships, among them the *Friedrich der Grosse* went into yards to be refitted. The reasoning of the Admiralty proved to be correct. As the enemy finished his scouting through which the position of our advance guards was ascertained, and as his submarines had gained the information that our torpedo boats and light cruisers had advanced about 25 to 30 miles from the Outer Elbe Light Vessel without support from the larger ships, the enemy deemed it advisable to make a surprise attack with more powerful ships that would cut off our retreat to the mouth of the Elbe and so destroy our advance guard. This plan was carried out on August 28, and was favored by the low visibility.

Should our light forces be sighted by the more powerful enemy, it meant certain destruction; because of the low visibility, they would be unable to sight the enemy until within range of his guns. The sinking of the *Nainz Koln* and the *Ariadne* was brought about in

this way, as these vessels, with great bravery, went forth to meet the enemy when the torpedo boats had warned them of the approach of the enemy. All the scouting torpedo boats, except *V–87*, were able to escape, thanks to the thick smoke screen and their high speed. It was very unfortunate that the zone of the U-boats, which during the first weeks of the war was not far behind that of the torpedo boats, had to be given up, as at that time the U-boats were required elsewhere: otherwise one of the U-boats would almost certainly have been able to attack the hostile First Battle Cruiser Squadron, or light cruisers. When more powerful German vessels arrived upon the scene the enemy had retired, taking with him prisoners from the sunken German ships.

On this day there were in Heligoland about a dozen U-boats ready. They had already received orders to advance westward, but were recalled by the chief of the U-boat flotilla in Heligoland, as he did not consider that U-boats would be successful, owing to the low visibility.

The 28th of August might easily have been a great success for our young fleet if the commander of the fleet had deduced, from the frequent presence of hostile submarines in the Heligoland Bight, the conclusion that these submarines were scouting and preparing for a hostile enterprise. If we had changed our defensive plans accordingly instead of using only light cruisers, assisted by torpedo boats, for one whole month. It would have been a very good plan to have had the big ships go out in the evening on all days on which the weather was favorable for a hostile entry into the bight, that these ships might have been in an advanced westerly position on the next morning. If the enemy had then carried out his attack on the morning of the 28th of August, the enemy hostile cruisers would have met unexpectedly the German battleships. The battle might have been a great success. The days on which the weather was favorable for attack were very few, and the enemy was forced to bring his torpedo boats as defense against our U-boats. The full use of destroyers was only possible when the sea was calm.

The battle of the 28th of August depressed the morale of the High Sea Fleet considerably, and during the ensuing period all steps possible were taken to make the work of the U-boats as successful as possible.

To begin with their disposition was changed. It appeared desirable to move some of the boats to the Ems, as they were able to proceed north more quickly from there and could in this way protect the flank of the German Bight toward the west. On the 3d of September the third U-boat flotilla, comprising the U–19 to U–22 and the U–24 to U–28, was sent there. The tender of the second U-boat flotilla, the *Stettin* followed soon after.

Korvetten Kapitan Bauer, who up to this time had been chief of the first U-boat flotilla, was now appointed chief of the U-boats.

The fourth half flotilla, which was also directed to proceed to the Ems, comprised the new boats U–27, 29, and 30. This flotilla was to finish its training in the Baltic: therefore during the month of September boats of the Heligoland flotilla were sent as reinforcements as it was thought possible that the enemy would repeat his raids into the German Bight.

The U-boats advanced repeatedly during this period from the Ems against hostile forces, which had been announced to be north of Amirland and Terschelling by our air scouts, but they were not able to score successes. The enemy knew, of course, that the U-boats had been moved to the Ems and was correspondingly careful.

We will point out the tremendous advantage that the British Admiralty enjoyed due to the neutral States of Holland and Denmark adjoining the German Bight. The enemy thus enjoyed extraordinary facilities for spying and one might say that the British Admiralty obtained reports from their agents in the neutral States concerning the disposition of our ships, the weather in the German Bight and other information whenever they contemplated entering the bight. The knowledge of being under observation in this way was very detrimental to the activities of our fleet in the German Bight. For this reason our ships did not like to go to the Ems as they feared that their movements would be reported to the enemy.

But while the U-boats were being utilized for the defense of the German bight, the offensive was not being neglected. *U–20* and *U–21* were sent to the Firth of Forth at the beginning of September. The commander of *U–21*, Kapitan Leutnant Hersing, scored on the 5th of September at 4.45 p. m. the first U-boat success of the war, yes of history, by torpedoing the small British cruiser *Pathfinder*, which was returning to the Firth of Forth. This first success was followed on the 22d of September by Weddingen's historical deed of sinking the *Hogue* and *Aboukir* and the *Cressy*. The *U–9* was detailed to attempt for the first time the passage of the Straits of Dover, but not far from the Maas Light Vessel, near the Hook of Holland, the three ships mentioned were sighted. The second and third came to the assistance of the first trying to save men, and all three fell a prey to the torpedoes of one U-boat.

These three ships were on patrol, as in the days of old, proceeding very slowly, and without destroyers to protect their flanks. The orders issued by the British Admiralty shortly after this occurrence did not leave the U-boats much hope of meeting any more ships behaving so carelessly. But the keenness of the commanders of the submarines was roused.

On the 15th of October the old English cruiser *Hawke* fell a prey in the northern part of the North Sea to a further well-aimed torpedo of Weddingen.

On the 18th of October *U–27*, commanded by Kapitan Leutnant Wegener, who later fell a victim to the *Baralong* murder, torpedoed the British submarine *E–3* near the mouth of the Ems. This was the result of a plan made against the enemy submarine operations at the mouth of the Ems. For since German U-boats had been stationed at the Ems, the English submarines had tried hard to surprise them when entering or leaving the river. The German torpedo boat *S–116* was sunk on the 6th of October, close to the mouth of the Ems by a hostile submarine.

During the last days of September the *U–18*, commanded by Kapitan Leutnant von Hennig, passed for the first time through the Straits of Dover. This passage was difficult on account of the strong current and the numerous sand banks. This boat found that the buoys were in the same positions as in times of peace and that the light vessels were showing lights as usual. In the straits small cruisers, destroyers, and submarines were met. *U–18* attacked the small cruiser *Attentive*, which was just examining a steamer, but missed her.

The enemy retaliated to this passage by mining the whole section between the Goodwin Sands, Rugtingen Sands, and the French coasts. But fortunately, the English knew little about mine laying at that period. The mines were laid mostly on the surface, so that one could avoid them during the day when on the surface; this was possible, as the enemy avoided the mined area.

From this period there was more activity in the Straits of Dover. U–19 was ordered near the end of October to get close to Zeebrugge, which had been taken by the Army; but by an unfortunate accident the boat collided with the British destroyer *Badger* on a very dark night and was pushed alongside her. The commander, Kapitän Leutnant Kolber, dived and escaped destruction. The enemy assumed that the boat was sunk and published reports accordingly, but this boat worked during the entire period of the war. In February, 1918, when commanded by Kapitän Leutnant Spiess, she sunk 36,000 tons of mercantile vessels in the Irish Sea.

The first cruises through the Straits of Dover were carried out by U–20, commanded by Kapitän Leutnant Drëscher; U–28, commanded by Kapitän Leutnant Freiherr von Forstner; U–30, commanded by Kapitän Leutnant von Rosenberg Grusczni. U–20 returned around Ireland and Scotland and proved that both the material and crew were equal to such a long journey. U–29, commanded by Kapitän Leutnant Plange, repeated soon after the same trip. U–27, com-

manded by Kapitän Leutnant Wegener, sunk, on the 31st of October, not far from Calais, the small British cruiser *Hermes*.

When on the 3d of November the high sea fleet took the offensive for the first time, the mission being to bombard the English coast close to Yarmouth, all available U-boats were placed in such positions that they could announce hostile forces or cover the retreat. But as the German cruisers were not disturbed by hostile forces the U-boats did not come into action.

These independent U-boat enterprises took place not only in the south but attempts were also made to sink hostile vessels in the north.

The U–16, commanded by the enterprising Kapitän Leutnant Hansen, penetrated into the harbor of Lerwick in the Shetlands, but did not find any warships there; only merchant vessels.

The U–22, commanded by Kapitän Leutnant Hoppe, searched on the journey all possible hiding places in the north of Scotland, especially in the Minch, but did not find any hostile forces.

Full of impatience, the U–18, commanded by Kapitän Leutnant von Hennig, penetrated past the Pentland Skerries into the Hoxa Sound, which is the southern approach to Scapa Flow, because it was certainly expected that powerful British ships would be there. Actually the boat was able to penetrate to a position from which it could search the anchorage, which represented a masterpiece of navigation owing to the number of rocks in the channel, but then the boat was disappointed, for there were no big ships in the bight, so that the boat had to return without having scored a success. It was a very hard fate that the U–18 ran upon the rocks when chased by destroyers and had to be abandoned by the crew, as she was so badly damaged. She was sunk by her crew.

Consideration of the U-boat War and the Early Activities Against Merchant Vessels.

Despite all efforts made and especially when compared with the number of miles covered and the ships lost, the result of the submarine warfare from the beginning of the war until October, 1914, was unimportant.

Even before Weddingen scored his success of sinking a warship the question of using U-boats against hostile merchant vessels had been discussed with the chief of the U-boat department in Wilhelmshaven, as it was considered that this would be more effective than the U-boats stalking warships only. This suggestion was not a new one for Conan Doyle had already shown in one of his stories how a small enemy State could bring England to her knees by employing a few U-boats capable of sinking merchant ships. Conan Doyle's description was very tempting and it seemed easy in his story, but many submarine commanders were anything but optimistic regarding this matter.

During November, 1914, Admiral von Tirpitz inquired of the American agent von Wiegand as to what position America would take if Germany should begin a U-boat war against hostile merchantmen. In a good many cases members of the U-boat force had the impression that the publication of the interview would be the signal for England to organize defensive measures against the German U-boat war against mercantile vessels, and that it would have been better to surprise England by the new warfare. But every member of a U-boat crew was very glad now to belong to that part of the fleet which was to be the most active during the war, and which was to have a deciding influence on the war, as everybody agreed after the battle of the Marne.

Views differed to a great extent if the boats available at the beginning of 1915 would be sufficient for an effective war against hostile merchant shipping.

The numbers of U-boats in actual use had not increased considerably during the period from the outbreak of war to the end of 1914. On the 1st of January, 1915, there were 20 boats in the North Sea and 7 in the Baltic. *U–23* and *U–25*, which had at first been sent to the North Sea, had been used against Russia since September, 1914. *U–26*, which was also active in the Baltic, and which was commanded by Kapitan Leutnant Freiherr von Berckheim, had sunk the Russian cruiser *Pallada* on the 11th of October, 1914, near the Gulf of Finland. Neither were there many boats under construction, though a special small type that could be built very rapidly had been ordered for the Flemish coast soon after the army had occupied the same, but it was not considered that this type could be used effectively before June, 1915. The production of big boats was slow, and of the 20 boats which were in the North Sea on the 1st of January, 1915, 9 were equipped with petrol engines and not very reliable. Under these conditions the opinion of commanders of U-boats in service was that it would be unwise to start with a U-boat campaign against merchant shipping on a large scale before the middle of or the end of 1915; but that it would be best to prepare for this with all energy by ordering as many submarines as possible, by arming the existing big boats with guns, and in the meantime to carry on with fleet and U-boats together as had been done in the attack on Yarmouth on 3d November, 1914. If it could be done in this way, then it was not to be feared that the enemy would bring out more effective counter measures. In the meantime more U-boats would, one by one, be entering the war against merchantmen, otherwise the counter measures might be quite considerable before the U-boat campaign would be fully effective. We will see later that this view was not taken and that the U-boat war against merchant shipping was opened on 18th February, 1915. The reasons for this decision will be given later.

From the above it is clear that the U-boat commanders accepted at a very early stage the idea of sinking merchant vessels and had begun war against such shipping in certain cases already in October, 1914. The *U–17*, commanded by Kapitan Leutnant Feldkirehrer, sunk on 20th of October, 1914, the British steamer *Glytra* not far from the Norwegian coast, according to the principles of the cruiser war, after having given the crew time and opportunity to leave the steamer. It is interesting to note that this first sinking of a British steamer by a German U-boat was witnessed by a Norwegian torpedo boat which had come upon the scene with three cheers for *U–17*. The *U–21* sunk in a similar way the steamers *Primo* and *Malachite* in November in the eastern part of the Straits of Dover.

The U-boat war against merchant shipping became more effective till it culminated in the declaration of the U-boat blockade on February 18, 1915. During January, 1915, seven merchant vessels displacing 17,577 tons gross were sunk; during February nine ships displacing 22,785 tons gross were sunk. Though these results were not decisive, the enemy recognized the necessity for a systematic defense.

We will now discuss the U-boat activity up to February 18, 1915. At the end of the first year of the war and at the beginning of the second year the U-boats were used as a means of defense against the blockade of the mouth of German rivers, by means of which the British fleet attempted to compel the German fleet to remain in the Jade, Weser, Elbe, and Ems. This was especially the case with boats that had been recently delivered or with those that were not considered efficient enough to make long cruises. These boats were stationed in advance positions off the mouth of the Ems near Heligoland to signal the approach of hostile forces and to attack them if possible. But the boats never saw the enemy except on the 24th of December, 1914, when he tried to disturb the German Christmas celebrations by an air attack. On the 25th of December enemy forces off the northwest of Heligoland were reported. *U–20* was already in an advanced position at the mouth of the Ems. *U–22* and *U–30* left immediately after the report was received. All three vessels sighted the enemy. An attack by *U–20* against a small cruiser became impossible at the very last moment as the enemy turned away at full speed. The enemy behaved on this day just as was to be expected according to the experience of the U-boats. Destroyers which changed course all the time were swarming around the bigger units, and even the latter steered a zigzag course.

The Beginning of the U-boat Activities in Flanders up to the Commencement of the U-boat Blockade, 18 February, 1915.

We have already stated that the *U–19* had been ordered during the latter part of October to proceed to Zeebrugge, but that she was prevented from reaching the harbor. Soon afterwards the *U–5*, *U–11*,

and *U–12* were sent there. The *U–12*, on the 12 November, 1914, sunk the torpedo boat *Viger*, anchored off Deal. This boat was navigated by Kapitan Leutnant Fortsmann, who became well known later on due to his successes in the Mediterranean, and we must concede that this feat was a masterpiece from a nautical point of view, as he was compelled to navigate in the shallow water between the British coast and the dangerous Goodwin Sands. Afterwards he tried to sink hostile monitors which were moored between the sand bank close to the French-Belgian coast. He was the first to point out the great difficulties which submarines encountered, which consisted of strong currents and numerous sand banks and very effective defense of the enemy. The *U–5*, commanded by Kapitan Leutnant Lemmer, and the *U–11*, commanded by Kapitan Leutnant von Suchodoletz, were lost during 1915 in Flanders; it is assumed that the *U–5* ran upon a mine and the *U–11* was sunk when attacking Dover.

The *U–25*, commanded by Kapitan Leutnant Schmeder, went to Flanders just before Christmas, operating from the base; this boat sunk during New Year's night, 1914–15, the British battleship *Formidable*, which belonged to a fleet of ships cruising off the south coast of England. The *U–24* had already tried in the afternoon of the previous day to torpedo this ship.

Thus at the beginning of the U-boat activities in Flanders there appeared those results that were so characteristic of the U-boats throughout the war, viz, successful attacks and high losses preceded by short journeys. We will see later that these conditions determined the future of the U-boat operations.

The *U–8* and the *U–29* were also in Flanders until the 18 February.

The Bombardment of Scarborough and Hartlepool, 10 December, 1914, and the Battle of the Dogger Bank on 24 January, 1915.

The submarines cooperated in the bombardment of the British coast in December, 1914. The field of operations was reconnoitered very carefully during two trips by the *U–27*, commanded by Kapitan Leutnant Wegener, who cleared a path free of mines for those vessels taking part in the bombardment. That the U-boats did not participate in any other way was much regretted.

First, one had to reckon with the possibility that in the case of such a daring attack warships would leave the Firth of Forth and steer south. U-boats were at the time of the bombardment in such positions that they protected the flanks of our ships to the north and south up to a distance of 60 miles from the British coast and they would undoubtedly have had opportunities of attack. That this theory is correct we will prove later when we discuss the attack made by Admiral Scheer on the 19th of August, 1916, when in a similar case, though no bombardment of a coast took place, two light

enemy cruisers were sunk and a battleship badly damaged by U-boats similarly placed.

Secondly, if the U-boats had been used Admiral von Ingenohl might not have been forced to turn with his whole fleet as soon as he did at 8 a. m. on the 16th of December when at a distance of about 120 miles from the cruisers (who were in the van), he returned to the German bight. He would have felt safely protected by the U-boats and might have engaged successfully the Second Battleship Squadron which was sighted by our cruisers about noon on the 16th of December to the westward of the Dogger bank. This squadron was less powerful than our own forces.

In the case of the cruise to the Dogger bank (on 24 January, 1915) of the battle cruisers *Seydlitz*, *Moltke*, *Derflinger*, the armored cruiser *Blucher* and the accompanying small cruisers and torpedo-boat flotillas, the presence of U-boats would have been very important, as the enterprise was carried out without the assistance of battleships. At the mouth of the Ems there were on the afternoon of the 23d *U–19*, *U–21*, *U–32*, and *U–33* at the disposal of the high command, and these boats could have left on the same day for the rendezvous of our battle cruisers. They could have been used on the 24th during the engagement against the retreating damaged British ships, some of which were being towed. The *U–21* left instead on the afternoon of the 23d to sink merchant ships in the Irish Sea. The *U–19* and the *U–33* were ordered to be in readiness in the Ems and the *U–32* lay waiting 15 miles north of Borkum. Even in Heligoland several U-boats could have been ready for the same purpose. The chief of the U-flotilla in the Ems, when he received, on the morning of the 24th of January, the message from Admiral Hipper regarding the sighting of hostile forces, sent immediately the three U-boats at his disposal to the assistance of our own cruisers, which were engaged in battle with five superior British battle cruisers. But it was too late. The enemy disengaged upon nearing our submarines and mines. Thus the U-boats did not have a chance to attack the enemy ships, and Admiral von Ingenohl lost his chance on the very day on which the armored cruiser *Blucher* was sunk. This was the third time that we lost ships due to insufficient support by submarines.

But such days were counterbalanced by new deeds of the U-boats, about which the enemy press was very excited. The *U–21*, which took no part in the engagement of 24th of January, left for the Irish Sea, bombarded a hostile airship shed at Barrow-in-Furness, and sunk three steamers about 15 miles off Liverpool. The *U–20*, commanded by Kapitan Leutnant Schweiger, at the beginning of February sunk three large steamers in the eastern part of the Straits

of Dover. The *U–16*, commanded by Kapitan Leutnant Hanses, and the *U–8*, commanded by Kapitan Leutnant Stoss, also took part in the campaign against merchantmen. The *U–19* sunk the British steamer *Durward* and took the crew of this ship to the Maas Light Vessel.

This completes the description of the first phase of the U-boat war.

Retrospection.

We have seen that the activities of the U-boats, which were at first directed against warships, led to the U-boat war against merchantmen. But this change of policy took place very slowly, without attracting much attention, and chances to torpedo enemy warships were lost as on January 24, 1915. We will see that in the next period, which lasts to October, 1915, that the enemy counter-measures became very effective—i. e., during the period before the U-boat blockade was declared. An old officer of the U-boat forces remarked when receiving his orders for the U-boat blockade at the end of February, 1915, that with the losses to be expected and the small number of boats under construction the submarine war against merchantmen in the North Sea would have to cease during the autumn of 1915. We will see that this prophecy was correct, and that the opinion of a section of the U-boat commanders was right when they stated that the U-boat war against merchantmen should not start before the middle or end of 1915. Otto Weddingen was of this opinion when he left on his last journey in March, 1915. But why was the U-boat war against merchantmen begun so soon? Because a great number of men did not believe that the war would last long and were convinced of a speedy victory by the Army. They therefore decided to use the U-boats at their disposal as soon as possible, more to assist than to be decisive till it became advisable to make use of the fleet in addition. One could arrive at the former conclusion only by feeling instinctively that victory could not be gained on land after the Marne battle; that the fleet would play a secondary rôle only; and that the decision would be won by a purely U-boat war. Then the U-boat activities should have been delayed to the time when a supply of boats was assured, thus obviating the necessity of periodic pauses in this warfare. The commander of the U-boats in the North Sea, Korvettenkapitan Bauer, was one of the first to recognize clearly that a decision would be won by a purely U-boat war.

We have mentioned above the number of boats we possessed at the outbreak of war. We will now investigate the gains and losses up to February, 1915. In the North Sea the following boats had been added to the fleet: *U–27* to *U–37*. The following had been lost: *U–5*, *U–7*, *U–11*, *U–13*, *U–15*, *U–18*, and *U–31*.

The *U–7* had been torpedoed by a German U-boat, due to wrong recognition signals. The *U–31* was lost either because of faulty diving gear or gas poisoning. This boat was found later by the British, drifting, and the interior quite dry, but the crew were dead. How the other boats were lost has already been described above. Thus it is shown that 4 boats only were added to the U-boats in the North Sea, making a total of 25 boats. Not more than 25 boats were used on the North Sea front up to the autumn of 1914. In the Baltic there were at the end of 1914 7 boats that could not for the time being be used in the U-boat war against merchantmen.

But what was under construction? As it had been recognized that U-boats could be used advantageously off the coast of Flanders, small torpedo and mine-laying U-boats that could be quickly fabricated had been ordered. These were the boats *UB–1* to *UB–17*, and *UC–1 to UC–15*, a total of 33 boats. They were so small that their components could be carried by rail and then quickly assembled at Pola, or at the yards in Flanders. The decision to build these boats was quite correct, the essential thing being to build something quickly, even if the boats were not very powerful. They were fitted with motor-boat engines and were, naturally, not of a very efficient type. *UB–18* to *UB–47* and *UC–16* to *UC–79* and *94–B II* and *C II*—boats which represented an improved type of the small B, etc., boats—were also started. Engines for them were ordered, so that the construction could proceed rapidly after the first B and C boats had been tried. The B. II boats were also quietly ordered. Construction of the C. II boats was delayed until experience had been gained with the C. I boats.

Ten big mine-laying boats had been started at the beginning of 1915, and the following large torpedo U-boats had been ordered prior to the outbreak of war, and were either building or undergoing trials: *U–38*, *U–39*, *U–40*, *U–41*, *U–43*, *U–44*, and *U–45*. At the outbreak of war, *U–46* to *U–62* had been ordered. Early in 1915, *U–63* up to *U–65*.

For the Austrian Navy five large torpedo U-boats were under construction, viz, *U–66* to *U–70*; these boats could be taken over by us after slight alterations.

When the U-boat blockade was ordered the total of boats ordered and under construction was 42 large and 127 small.

The reader will ask if this was a large number. We must therefore give him a scale: When the revolution broke out in November, 1918, we had under construction 440 U-boats, among them 137 large ones, and a further 330 U-boats, among them 117 large ones, were just about to be ordered. Of these 770 boats, 360 would have been completed in 1919, and the remaining 410 during 1920, as the U-boat department had laid their plans very carefully.

It would not be just, however, to say that we should have ordered U-boats toward the end of 1914, thus conforming to a policy which only became a necessity in 1918. A stage of development was necessary before this was possible, but one might certainly argue that a greater number of torpedo U-boats of the type *U–31* to *U–41* might have been ordered with a few improvements. Then it would have occurred to the department concerned that further yards could be used to build U-boats besides the yards then building (Germania, Kiel: imperial yard, Danzig; Weser yard, Bremen; and Vulkan, Hamburg), one might also have let the inland firms assist in U-boat construction, for instance, structural steel firms.

The provision for U-boat repairing stations was not undertaken on a sufficiently large scale. This was only done effectively in Flanders (Beuges, Ostend, and Antwerp), due to the U-boat flotilla chief of Flanders, Korvetten-Kapitan Bartenbach. We will see later how very much this point helped the U-boat activities in Flanders during the entire period of the war.

Together with the possibility of construction and repairing submarines, one had to deal with the question of staff in a very large way. One had not only to provide crews for the U-boats and to train them, but one had also to provide a great number of auxiliaries. A large number of engineers had to be taken from the Army to assist our naval constructors and had to be trained in U-boat building and repairs. For how else could one provide inspectors and supervisors for the yards and repairing stations? Finally, one had to take or transfer an army of draftsmen, engineers, and mechanics from the army to the navy.

Why was not that done at the right time? A number of answers to this question have been published since the end of the war. There can be no doubt that even at the beginning of 1915 Admiral von Tirpitz was still hoping that he would be able to make effective use of the fleet, and that he was not willing to change the whole naval organization to suit the purely U-boat program. This idea was, as one can see from his memoirs, that the U-boat should only bridge the gap till the high-seas fleet could take part in the war. Had he known that this would never happen, then he would have changed the whole organization at the beginning of 1915 to conform to the policy of a U-boat war.

Taking into account what has been learned from the enemy, we may say to-day that the decision should have been made about in 1917 if the change to U-boat warfare had taken place in 1915. But could not the fleet together with the U-boats have been successful? The answer is in the affirmative. A further discussion will show that we were, unfortunately, during the whole of the war made to

bring our U-boats in sufficient numbers to the battle field when our fleet gave battle. The reasons for this will be learned later.

In conclusion, we may say during the beginning of 1915 it did not matter much if one decided to adopt the purely U-boat war or a war with high-sea fleet and U-boats in combination. The main thing was to recognize the necessity, after the Battle of the Marne, that the war must be decided at sea, and that we recognized that the sea war was to be quite as important as the land war. Admiral von Tirpitz knew this; and, after what we have learned from the enemy, there is no doubt that victory would have been ours if we had taken either of the two paths.

Looking back, we must not forget the pioneer work that was done by the U-boat commanders and crews during the first part of the U-boat war.

The later U-boat activity produced magnificent vessels, a result based upon the experience gained during the first part of the war.

During the war the U-boat crews were very well trained, but during the practice cruises in peace times there were a great number of precautions taken to prevent accidents. During the war these precautions were not taken, and the boats were compelled to rely upon themselves, far from their bases, and menaced by hostile attacks.

Diving in a heavy sea took a fairly long time, and the boats had to be prepared to dive or fight by day and night. The peace training was not sufficient for this. One had to see what could be done during the night when on the surface. A great help in this case was the invisibility of the boats at night, which was far more pronounced than in the case of torpedo boats. Very often boats passed enemy destroyers during the night quite close without being seen.

But soon the enemy destroyer became a very serious obstacle to the U-boat; even though these boats only tried to ram diving or submerged U-boats, other means of attack being lacking. Often our U-boats tried to attack destroyers—most of all Weddingen—but soon he came to the conclusion that this was not advisable except under particularly favorable circumstances. Very soon, he tells us, the destroyer passes over the U-boat, which has difficulty in escaping by diving.

During the daytime we had to avoid hostile submarine attacks. The enemy waited at important points on the ordinary navigational routes to surprise our boats, but soon the U-boats learned to pass those places submerged or at high speed.

Soon afterwards we heard of U-boat nets, against which one had to provide net cutters. The necessary additions were made during the overhaul between trips. One must also remember the efforts

which were required to keep the oil engines and electrical equipment in order during these long cruises. The numerous breakdowns of the petrol engines in the older boats strained the engineering staffs to an extraordinary degree. Everywhere engineers.

CHINKAI.

Source: Reliable.

(4182.)

June 3, 1920.

A vice admiral is in command of the station. An engineer captain is in charge of the machinery plant and all repair work.

There are about 60 officers attached to the station (50 commissioned and 10 warrant) and 800 enlisted men.

Adjacent to the station is the new town of Chinkai, laid out and fostered by the Japanese Government. There are houses to accommodate 5,000 people. Houses are all new. The town is only about five years old. It is laid out radially from a center where is located the post office. In the town are 128 houses for officers and men, 28 for officers and 100 for men. Only a nominal rent is paid for these houses.

Attached to the station are four 400-ton torpedo boats, *Matsukaze*, *Asare*, *Nowaki*, and *Shirayuki*, and four 150-ton torpedo boats, *Sagi*, *Hibari*, *Hashitake*, and *Usura*. There are also two mine layers, one built for the purpose and of about 1,800 tons displacement, and the other about 1,500 tons displacement—a converted merchant vessel. The officers and men of these two vessels and of the eight torpedo boats are included in the 60 officers and 800 men attached to the station.

There is a fine new modern brick hospital, steam heated, that will accommodate 100 patients. It is provided with wards containing 10 to 20 beds, with officers' room, isolation ward, dispensary, modern American X-ray apparatus, developing room, dentist's office, with fine set of apparatus. Violet ray and vibrating sets, laboratory, offices, outdoor two-wheeled stretcher with rubber tires and wire wheels, operating room (light not the best), several sterilizer outfits, modern and adequate and manufactured in Japan, bath and wash rooms, and diet kitchen. The whole hospital has bright wood floors with strips of thin linoleum in the gangways. It is kept scrupulously clean. The senior medical officer is a captain, and he has four commissioned assistants. The dentist is a civilian. There are none in the Japanese Navy. The hospital is built in beautiful grounds and is thoroughly screened. The beds are iron, with fine thick, clean mattresses. Beds for surgical cases are provided, with an overhead bar that can be adjusted to plumb the sides, and there

are small pulley arrangements at each end for keeping an injured leg on the stretch. There were only 16 patients, all in bed (venereal). They were receiving the mercury treatment. A portion of their pay is forfeited while they are absent from duty on account of venereal reason. There is no other punishment except this fine.

Barracks:

There are two 3-storied brick barracks, well designed and built, located in beautiful grounds and commanding a view of mountains and water that is unsurpassed. One contains offices and rooms for officers; the other is for enlisted men, of which it can accommodate up to 400. On the first floor are two large rooms, very high ceilings, with huge crossbeam of wood carrying the hammock hooks. One hundred men can be very comfortably accommodated in each room. Overhead, running the length of the center, are hammock nettings, and below them long shelves that carry the men's flat, round, tin hatboxes. At the ends of the room, against the wall, deep big pigeonholes for their clothes bags (same size and shape as in the United States Navy), but black waterproofed canvas with number on white patch on bottom. Bags stowed on side with bottom out, showing number. Hammocks, bags, spotlessly clean. Hammocks made of unbleached canvas. Mess tables do not fold up or stow overhead, neither do mess benches; heavier and higher than ours; have no rims, and are larger than ours; evidently a barrack type. Men instantaneously called to attention by petty officers as we unexpectedly entered; men very well turned out and all in uniform; leggings very clean and well fitting and smart looking; men very sturdy and healthy looking, and show good feeding and successful handling by their officers. On the two upper floors of the barrack building are 40 rooms, each capable of accommodating 5 men. The kitchens, baths, washrooms, and toilet arrangements are excellently arranged and kept in spotless condition.

There are three small harbors lying in front of the naval station. The shore edge is stone faced and there is a breakwater to one of the harbors, the one nearest to Masan, with room inside for the two mine sweepers and six destroyers. Sheds and storehouses at this spot almost certainly contain mines in storage. The station is surrounded by mountains and hills. On the top of the hills between two of the small harbors is the radio. Two masts, each about 150 feet high, with 3 aerials. Chinkai has constant wireless communication with Sasebo and Kure naval stations.

There is a floating dry dock in the third small harbor, with a lifting capacity of 1,800 tons. On one side of the entrance to the middle or principal small harbor is what the aid said was the oil station. It may easily have been the mine storage depot.

No oil tanks were visible, only the houses in sight. Coal from Kiushu was very noticeable. There was certainly 5,000 tons of it. Also 11 large fine mooring buoys to be put down in the large well-protected roadstead leading into the principal small harbor. A whole fleet could anchor in the roadstead. There are 20 smaller mooring buoys suitable for second-class cruisers.

The Repair Plant.

One moderate-sized machine shop. Tools good. One pattern shop. One foundry, and one moderate-sized plate and blacksmith shop. The plant is able to make repairs for destroyers and torpedo boats.

There is a central power house that supplies steam and electricity to the station. A channel has been dredged to connect the town of Masan with the small harbor nearest to it, 5 miles.

The station is very well planned and laid out, and is capable of any amount of expansion. It can be easily and effectively defended against attack. The place possesses nearly every natural advantage and the Japanese naval officers have improved the natural conditions. Although only a few years old a really astounding amount has been accomplished. There is a fine officers' club, and commandant's house is very dignified and spacious, a beautiful garden. The administration building is stone-faced brick and very handsome and well planned.

NAVAL ESTIMATES FOR THE FISCAL YEAR 1920–1921—JAPAN.

Source: Reliable.

(12480.)

June 11, 1920.

The following estimates for the fiscal year 1920–21 were submitted to the Diet, but did not pass it on account of the House of Representatives having been dissolved.

The naval estimates for the fiscal year 1920–21 are:

	Yen.
Ordinary expenditures	124, 777, 342
Extraordinary expenditures	252, 993, 034
Total	377, 770, 376

Comparing these figures with those for the fiscal year 1919–20—

	Yen.
Ordinary expenditures	60, 886, 938
Extraordinary expenditures	188, 661, 254
Total	249, 548, 192

There is an increase in ordinary expenditures of 63,890,404 yen, and in extraordinary expenditures of 64,331,780 yen; total increase, 128,222,184 yen.

Principal items in which increases are required, are as follows:

Expenses for Maintaining Newly Built Ships.

With the progress of the program expenses for maintaining new ships are required, and an additional sum of 7,500,000 yen is estimated under ordinary expenditures, Title II.

Increase in the Expenses of Aviating Divisions.

From the experience obtained in the late war, it has become necessary to strengthen aviating forces, and the sum of 8,266,101 yen is estimated under ordinary expenditures, Title II, for maintaining them.

Increased Expenses Required as Result of Increase of Cadets, Students, etc.

With the increase of ships, expenses required for educating and training increased cadets, scholars, etc., increase, and the sum of 1,003,249 yen is estimated under ordinary expenditures, Title II.

Expenses Required for Aviating Machines Carried by Men-of-War.

From the lessons obtained in the late war it has become necessary for men-of-war to carry aviating machines, and for the maintenance of such machines the sum of 538,563 yen is estimated under ordinary expenditures, Title II; and the sum of 2,040,986 yen is estimated as continuing expenditures to be expended in four years from 1920–21 under extraordinary expenditures, the sum allotted to the year 1920–21 being 304,325 yen and estimated under extraordinary expenditures, Title V.

Increase in Expenses for Naval Supplies.

Owing to enlargement of the sphere of movements of naval vessels, they require greater amount of supplies, and the sum of 1,010,731 yen is estimated under ordinary expenditures, Title II.

Increase in Allowances for Service Afloat.

The rate of increase of pay and allowances for service afloat is too low and must be raised. For this purpose the sum of 585,699 yen is estimated under ordinary expenditures, Title II.

Increase in Provisions and Clothing Expenses.

The increase in ration and in the unit value of foodstuffs to be purchased, necessitate increase in provisions and clothing expenses, and the sum of 6,608,793 yen is estimated under ordinary expenditures, Title II.

Increase in the Expenses for Construction and Repair of Ships and Arms.

Owing to the rise of prices of goods, it is necessary to increase expenses for the construction and repair of ships and arms, and the sum of 13,227,721 yen is estimated under ordinary expenditures, Title II.

Increase in the Maintenance of Naval Vessels.

Due to rise of prices of goods, it is necessary to increase expenses for maintaining naval vessels, and the sum of 7,167,020 yen is estimated under ordinary expenditure, Title II.

Increase in Pay of Officers and Men.

Increase in pay and allowances of officers and men requires additional appropriation, and the sum of 12,332,696 yen is estimated under ordinary expenditures, Titles I and II, and of 44,414 yen, under extraordinary expenditures, Titles IX, X, and XII.

Expenses Required to Meet Increase in Office Expenses and Others in Consequence of Rise of Prices of Goods.

Office expenses and other expenses require increase owing to rise of prices of goods, and to meet such increase the sum of 2,122,416 yen is estimated under ordinary expenditures, Titles I and II, and the sum of 2,343 yen, under extraordinary expenditures, Titles IX and XII.

Appropriation for Building Men-of-War.

This is continuing expenditures from 1911–12 to 1923–24, but it being necessary to build men-of-war and other vessels in addition to those already authorized, the estimate for these additional vessels is 680,258,419 yen, to be expended from 1920–21 to 1927–28. The sum allotted for the year 1920–21 under the existing program also requires an increase in consequence of the rise of prices of goods, the sum estimated being 71,695,466 yen. Thus the sum to be added to the sum allotted to the year 1920–21 is estimated at 80,232,957 yen, and is requisitioned under extraordinary expenditures, Title II.

Appropriation for Shore Works.

This is a new title made by consolidating Titles "Shore works," "Expenses for equipping aviating divisions," and "Expenses for equipping radio stations," and two items of "Reconstruction of official residences, Bako," and "Reconstruction of men's quarters," all authorized as continuing expenditures. Now, with the growth of naval construction works, factories, defense divisions, educational organizations, hospitals, etc., must be enlarged and perfected, for which the estimate is 150,008,861 yen. The sums appropriated for the year 1920–21 for shore works, equipping aviation divisions and

radio stations under previous budget, require increase due to rise of prices of goods, the amount estimated being 4,199,968 yen. Thus the sum of 154,208,829 yen must be added to the appropriation already authorized, the period in which these works are to be done must be lengthened, and the amount to be expended each year must be readjusted; and the additional sum of 37,001,278 yen is estimated under extraordinary expenditures, Title III, for the year 1920–21.

Expenses for Building Miscellaneous Service Vessels.

With the extension of shore works and increase of men-of-war, an increase of miscellaneous service vessels is required. The sum of 2,352,357 yen is estimated for this purpose, to be expended in two years of 1920–21 and 1921–22, the sum allotted to 1920–21 being 1,398,346 yen, which is requisitioned under extraordinary expenditures, Title IV.

Spare Munitions of War.

With the increase of men-of-war and other vessels, and from the lessons obtained in the late war, it has become necessary to have stores of munitions of war, and the sum required for this purpose is estimated at 15,702,764 yen, to be expended in two years of 1920–21 and 1921–22. Of the above appropriation, the sum to be expended in 1920–21, 8,409,155 yen, is requisitioned under extraordinary expenditures, Title V.

Expenses Required for Articles Required for Educational Purposes.

With the increase of cadets and student officers and men, arms, and other articles for educational use must be increased, and the sum required for this purpose is estimated at 2,383,754 yen, to be expended in two years from 1920–21, and the sum allotted to the year 1921–22, 1,410,463 yen, is requisitioned under extraordinary expenditures, Title V.

Expenses Required for Remanufacturing Smokeless Powder.

The latest experience shows that remanufacturing of smokeless powder is necessary for its preservation. The amount required for this purpose is 11,230,032 yen, to be expended in four years from 1920–21. The sum allotted to the first year, 2,807,508 yen, is requisitioned under extraordinary expenditures, Title V.

Running Funds of Various Navy Yards.

With the growth of the construction works of ships and arms, the running funds of navy yards must be increased, and this year the sum of 500,000 yen is requisitioned under extraordinary expenditures, Title VI, in addition to the sum already authorized for that purpose.

Running Fund for the Navy Fuel Factory.

With the opening of this factory, the running fund is necessary. Such fund is to be increased year by year, and the sum of 700,000 yen is requisitioned for the year 1920–21 under extraordinary expenditures, Title VI.

	1920–21	1919–20
ORDINARY EXPENDITURES.		
	Yen.	Yen.
Table I.—Admiralty	603,324	374,568
Table II.—Expenses of naval service	124,149,177	60,489,459
Table III.—Various expenditures	24,841	22,911
	124,777,342	60,886,938
EXTRAORDINARY EXPENDITURES.		
Table I.—First period equipment of Chinkai (naval port)	305,484	400,000
Table II.—Replenishing naval preparations	185,667,466	152,277,823
Table III.—Shore works	46,248,890	21,909,358
Table IV.—Expenses for keeping in order men-of-war and other vessels	3,468,346	6,130,000
Table V.—Spare munitions of war	12,962,619	4,242,862
Table VI.—Funds to be paid into special accounts	2,900,000	1,700,000
Table VII.—New buildings and repairs	200,560	198,129
Table VIII.—Building and repair works	673,756	540,000
Table IX.—Civil engineering department	71,459	44,930
Table X.—Books and charts for sale	108,450	76,000
Table XI.—Expenses for replenishing arms	370,320	985,540
Table XII.—Expenses for managing business of pension	15,584	9,554
Table XIII.—Gratuities	100	100
Grand review	.....	30,000
Expenses for damages caused by natural calamities	.....	116,958
	252,993,034	188,661,254

Extraordinary War Fund, Army and Navy.

INCOME.

	Yen.
Damages, forfeits, penalties, etc	6,298
Sale of Government property, cattle, guano, etc	12,711,670
Public loan	148,716,671
Total	161,434,639

EXPENDITURES.

War expenses	146,434,639
Reserve	15,000,000

With the progress of events the extraordinary war fund will not be sufficient, and the above additional estimate is requisitioned for the year April, 1920, to March, 1921.

GERMAN SUBMARINES—DISCUSSION OF PAPER ON.

Source: Reliable.

(10990.)

May 17, 1920.

The following article is a discussion by Chief Constructor Johns of the Admiralty on Commander E. S. Land's article, "Submarines in general and German submarines in particular."

Commander Land's paper is an interesting one and reflects the virile personality of its writer. He points out that from two main causes—secrecy and method of use by the Germans—the submarine has a most evil reputation. This is undeserved and those who study its design, construction, and operation will find it a most fascinating subject. So far as design is concerned, for its surface navigation the same qualities are necessary as for surface ships. For submerged navigation a new set of circumstances arise which must be superimposed on those already mentioned. Design is therefore far more complicated and difficult than is the case for ordinary ships. Its small size and the multiplicity of its fittings render construction and completion also more difficult. So far as its method of operation during war is concerned, it is unpopular, because, as many point out, it skulks below the surface and waits and watches for its prey. They forget it is only utilizing one of the most ancient maxims in war and sport—i. e., that of taking cover. It does this in the only effective manner possible in sea warfare.

There is, however, another reason for some of its unpopularity. It has to be remembered that "submarining" is a young man's game and only a relatively small number of naval officers serve in the submarine service. Its introduction is relatively recent and, consequently, it is only a very few of the senior officers of the services who have any personal knowledge of its value and limitations. Naturally the older senior officers considered it a new-fangled contrivance and looked upon its advent with suspicion, if not with disfavor. Its employment in warfare fundamentally altered many of those principles of tactics and strategy with which they were familiar. A privileged few of the senior officers were taken out on a submarine on show occasions, saw how smoothly its operations were carried out, and went home and wrote letters to the press on the futility of building battleships. They had seen it at its best and could not appreciate its limitations. At the present time this unpopularity is decreasing, thanks to the lessons of the war, and also by the entry into the senior ranks of the service of some of the earliest and most experienced submarine officers.

Luckily for the Allies, Germany's naval autocrat, Von Tirpitz, one of the senior officers, was not an enthusiastic admirer of the submarine, and consequently Germany built few before the war; starting

their construction far later than other nations and apparently only then because the latter were increasing their numbers.

Commander Land points out that the submarine has proved beyond a doubt its value as an essential part of a navy. Nothing has confirmed this more than the reception given to the semiofficial announcement that the British Admiralty were in favor of its abolition. It might be accepted that a nation which has a large surface fleet of war and merchant ships and which suffered more serious losses during the war than any other nation from the submarine would be favorable to its abolition. The public press stated that practically all continental nations had strongly objected to the proposed abolition, and as far as can be judged the matter has dropped.

In the paper it is pointed out that the majority of boats built during the war were of about 850 tons displacement. Size is generally dependent on the weight and power of the engines available at the time of the design, as the latter has to be built around them. Most of the nations have developed submarine engines of from 1,000–1,200 B. H. P. as a maximum, and it almost naturally follows that the tonnage displacement of the boats built with these engines should be about the same. As soon, however, as the Germans had more powerful engines available the size of the boat showed an increase. Thus, the 1,750 B. H. P. engines fitted in *U–135* and *136* required a displacement of 1,150 tons and the 3,000 B. H. P. engines intended to have been fitted in *U–142* increased the displacement to 2,150 tons. All other classes of warships have increased in displacement, speed, and other qualities as soon as progress in marine engineering rendered more powerful engines available, and in this respect submarines will undoubtedly evolve along similar lines.

It was my very pleasant duty to accompany Commander Land in his inspection of German submarines, and I can confirm all that he has written of them. They were well-built boats but filled with "gilguys" and "gadgets," which are not usually found in the submarines of other nations. It was surprising to find many unnecessary fittings which must have taken time and labor to make and install, and at a time when celerity of completion was of the utmost importance to the Germans. Nothing in the boats bore the mark of being constructed or fitted hastily. Stories of rapid building reaches the allied countries, but information since received shows these stories to be false and that building and completion were slow. This is also confirmed by the cost of the boat, which is relatively much greater per ton than in other countries.

The 350 boats actually completed during the war cost about 1,400,000,000 marks. The value of the losses to allied merchant shipping and cargoes, and also the cost of antisubmarine measures, have

not yet been computed, but must represent an immense sum—many times greater than the cost of submarines.

In conclusion, I wish to express my most cordial appreciation both of the paper and of my most amiable and pleasant colleague on many journeys and inspections—the writer.

CHINESE TELEGRAPH SYSTEMS.

Source: Reliable.

(7900.)

27 May, 1920.

The Government telephone systems in China under the ministry of communications are all closely supervised if not actually controlled by the Japanese. This control was obtained by the usual method, i. e., the appointment in the ministry of communications of Japanese engineers, directors, etc., as part of the concessions in return for loans made with telephone systems as security.

The following is a complete list of Government, common battery exchanges existing or under construction:

Peking.—Three exchanges, about 11 lines; extensions under construction, 6,000 lines.

Tientsin.—One exchange, about 4,000 lines; extensions under construction, 1,200 lines.

Shanghai.—One exchange under construction, 3,000 lines.

In Chinese city: One exchange under construction, 2,000 lines; one, 600 lines.

In Pootung: One exchange under construction, 400 lines.

Hankow.—One exchange, 4,200 lines.

In Wuchang: One exchange, 800 lines.

Soochow.—One exchange under construction, 2,000 lines.

Nanking.—One exchange under construction, 2,000 lines; one, 800 lines.

In Pukow: One exchange under construction, 400 lines.

Private exchanges are known to exist in the following places:

	Lines.
Shanghai	10,000
Mukden	3,000
Tsinanfu	1,600
Canton	(?)
Hongkong	(?)
Harbin	(?)

There are a few small exchanges in other towns, but the foregoing are the important ones.

The following are all the long distance lines of importance:

In operation.—Peking to Tientsin.

Under construction.—Shanghai to Nanking. (This line will be extended within a year to Hankow, and to Peking via Tientsin, the materials for which are being delivered or are being purchased.)

Under definite consideration.—Peking to Kalgan; Peking to Mukden. (These lines will probably be under construction during 1921.)

Japanese line in operation.—Tsinanfu to Tsingtao. (This line is not open to the public, but it is believed prominent Japanese business houses use it.)

The Japanese are believed to have some lines in the area about Harbin but it is not yet known what they consist of.

THE NEW NAVAL PROGRAM OF BRAZIL—THE PRESIDENT OF BRAZIL'S MESSAGE TO CONGRESS.

Source: Reliable.

4 May, 1920.

The Navy Yard.

The navy feels the lack of an establishment which would give it the elements of preservation, mobilization, and preparation, without which it is impossible for it to exist. In general, its services are badly installed, its buildings unsuitable or paltry, scattered and distant from each other, necessitating a great deal of transportation, involving waste of time and money.

Immediate remedy for this state of things is urged, it having been complained of for many years. It was not possible to hope for the construction of a great military port, whose works would require protracted study and large resources, inasmuch as Rio de Janeiro is to be a natural, though secondary, base in the plan to be adopted. The Government did not hesitate to establish its school in the island of Cobras, with a view to placing there shops for the repair and care of all the material of the fleet, after ascertaining that it fulfilled the necessary conditions with respect to the plans of the administration, besides taking into consideration the expensive installations that would have to be made in another locality if it were preferred and the important works initiated by former administrations, in which great sums of money were squandered.

To condemn these works of incontestable value would be to lose the benefit of the sacrifice made and testify once more to the lack of perseverance and continuity which has been one of the evils of our administration.

The Government awaits with impatience the plans which are now being completed by the commission of technicians, so that it may authorize the construction.

After the works are once finished, consisting of a dock with a capacity for accommodating our largest ships, landing wharves, and shops which will replace those on the mainland and at Armacon, and which might be utilized as secondary bases, there will remain the task of making the industrial and technical services equal to those of other navies.. The rest of the naval bases, above all the great military port, although works of importance, must be left to the future, but should be carried on in accordance with the financial conditions of the country and the progress and development of the fleet.

The Fleet.

My predecessors, in successive messages, have emphasized the desirability of acquiring new units, above all fast cruisers, torpedo-boat destroyers, submarines, and mine layers.

Notwithstanding the fact that the financial situation dictates the greatest prudence in the authorization of expenditures, I believe we can not remain indifferent when we consider the diminishing power of our fleet. It is impossible to escape the necessity of giving to our undermined defense its indispensable elements—the acquisition of new submarines fully up to date, in view of the age of those we now have, the replacing of our worn-out units, and the modernizing and improvement of our ships so as to conform to technical naval progress which, during the past few years, has rapidly advanced.

I am pleased to state that the battleship *S. Paulo* on March 13 last returned from the United States, where she received a large amount of important repairs and underwent radical improvements, among other things the installation of fire control, establishing her as a war vessel of the first order.

The *Minas Geraes* will undergo the same transformation, in order to preserve the necessary homogenity with the rest of the fleet. To accomplish this it would be well to create a commission of technicians who will be charged with a study of the matter, and ultimately there will be required the cooperation of the American Government, in order that the vessel may remain abroad as short a time as possible.

CHILEAN NAVY.

Source: Reliable.

14 June, 1920.

The British Government in 1914 commandeered two dreadnaughts and four destroyers which were building in England for the Chilean Government. The Chilean Government had ordered six destroyers,

but two of them had already been delivered to Chile. The dreadnaught *Almirante Cochrane* became the battleship *Canada*, which has just been sold to Chile by the British Government for £1,100,000, which is half the cost price of that vessel. She has just sold to Chile also three destroyers of the same type as those commandeered in 1914 for the sum of £100,000 each, which is less than one-half of their cost price. She has also sold Chile one tug for about £30,000, and this tug, with four mine sweepers previously purchased, represents with the other ships sold a total of about £1,500,000, which, however, includes also payment for double ammunition allowances for all vessels and double torpedo allowance for each destroyer.

The Chileans are now negotiating for the purchase of their former dreadnaught, the *Almirante Latore*, which has been converted by the British Government into the airplane ship *Eagle*. There were two submarines building at the Seattle Dry Dock & Construction Co. in 1914, called the *C C–1* and *C C–2*, which the Chileans sold to Canada at the outbreak of the war. In 1916 the Chilean Government requested the British Government to allow them to take two of a number of submarines which were built in the United States at Boston, awaiting the completion of the war to be delivered to England. Instead, however, the British Government gave them five submarines, and subsequently sold them a sixth one at cost price. In other words, Chile got six submarines at the cost of one. Great Britain has also recently given to Chile 50 aeroplanes of all types for war purposes. Of these, 14 are seaplanes and 36 airplanes. Two of these airplanes, of 210 horsepower, have crossed the Andes Mountains and made record flights.

The result of Chile acquiring this naval war material from Great Britain has been that the President of Argentina, in his opening message to the Argentine Congress on May 17, 1920, submitted a bill for the increase of the Argentine Navy as follows: Four scout cruisers, 8 destroyers, transports aggregating 80,000 tons, 1 school ship, 1 hospital ship, 1 salvage vessel, 20 submarines, 48 barges, 4 navy-yard craft, hydroplanes, captive balloons, dirigibles, building and barracks at navy yards, total 80,000,000 pesos, to be provided for by issue of bonds.

NAVAL AND MILITARY ITEMS: JAPAN.

Source: Reliable.

(12925.)

11 June, 1920.

The French cruiser *d'Estrees* has been in Yokohama for the past 10 days on an official visit.

The two Italian aviators, Ferrarin and Masiero, have arrived in Tokyo (31 May, 1920), and received a warm welcome at the hands

of the military authorities. The foreign office is taking little interest in the visit, much to the disgust of the military. They have been decorated with the Fifth Order of the Sacred Treasure.

It has been announced that the keel of the *Amagi*, battle cruiser of 36,000 tons, will be laid in Yokosuka by November. Some of the 16-inch guns for her armament are already completed at Kure and Muroran.

The 50 German airships allotted Japan by the treaty will arrive here in December.

Owing to an explosion of an oxygen compressor at the Atsuta Arsenal, Nagoya, in the afternoon of the 21st of May, two persons were killed.

The warship *Chitose* left Kure 3 June, to become the flagship of the Yangtze Squadron.

Vice Admiral K. Funakoshi, former naval attaché to London, has been appointed commander of the Training Squadron, in place of Vice Admiral S. Horiuchi.

Capt. R. W. Russel and Mr. R. R. Glenn have arrived in Tokyo as honorary attachés to the British Embassy.

The Muroran Steel Foundry has discharged over 700 clerks and workmen.

A peculiar affliction has made its appearance among the soldiers of the Third Division at Nagoya. The symptoms of this disorder are complete loss of the sense of taste, smell, and feeling, with a temperature which varies from 39° to 41° C. The doctors have been unable to classify the disease.

The schooner *Unyo Maru*, of the fishery school, left Shinagawa for the South Pacific islands with a party of 70 students and several instructors of the school for fishery training.

Flight Lieut. Kitagawa and his flight sergeant were severely injured on Monday while flying at Shimoshizu. Engine trouble developed and the plane plunged to the ground. Lieut. Kitagawa it is expected will not recover from his injuries.

The warship *Kasuga* left Japan on 26th May to represent Japan at the Maine Exposition.

With the object of gathering data that will increase the safety of navigation and lessen the number of sea accidents, the Government has decided to establish an oceanic meteorological observatory at Kobe this year.

RADIO COMMUNICATION: FRANCE.

Source: Reliable.

July 3, 1920.

Under Secretary of State for the Post, Telegraph, and Telephone Services Deschamps has announced that the French Government plans for an elaborate wireless system whose center will be in Paris

and which will cover Europe, Asia, Africa, and South America, and connect with North America. If this system, part of which is already in existence, is integrally applied as now proposed, France's wireless communications throughout the world will be able to rival with Great Britain's cable communications. According to the details made public by M. Deschamps at a recent meeting at Rennes, wireless communication was established with Hungary May 20, 1920, and will soon be opened with Belgrade. For commercial communication with the United States there is to be a station at Doua, near Lyons, in addition to that in construction at Croix-d'Hins, near Bordeaux. Between France and her colonies there will be stations with a range of 7,500 miles at Saigon and at Tahiti. Stations with a radius of at least 4,375 miles will be established at Djibouti, Tananarive, Noumea, and French Martinique, also secondary stations at Pondichery and French Guiana. In Africa, the system will include stations at Saida and Bamako which will take care of the traffic between Paris, Algeria, and West Africa, another station in Senegal, near Dakar, and finally that of Brazzaville. The stations of Saida, Bamako, Brazzaville, Tananarive, and Saigon are, at present, in course of construction. The other stations will be commenced after the vote of Parliament on the project of law which M. Deschamps will bring before it in a few days.

THE GEOLOGY OF CHINA'S IRON DEPOSITS.

Source: Reliable (American Mining Engineer).

19 May, 1920.

(9596.)

Five types of deposits may be conveniently discriminated, though the grouping is not exact.

1. Ancient banded ores: These are found in the Pre-Cambrian and early Cambrian formations. They include hematite and magnetite, are frequently lean and so metamorphosed that it would be impossible without much study to be sure whether they were originally sedimentary or not. It is ores of this type that occur in southern Manchuria and northeastern Chihli. The Penshihu, Anshanshan, and Lanchow may be cited as examples. In developing them the principal drawback is that much of the ore will require concentration, either wet or magnetic, with a consequent necessary resort to briquetting in order to make a good furnace product.

2. Sedimentary carbonates and hematites: These are the ores which have mainly supplied the native furnaces. Aside from the fact that

the carbonate ores require roasting to bring them up to furnace grade, the essential difficulty in the way of making further use of them is the fact that the individual bodies of ore are too small to be economically mined. The Shansi and Paoking deposits are examples.

3. Sedimentary colites: These are the ores in which the main have all the appearance of the well-known Clinton ores in America. In northwestern Chihli and perhaps elsewhere they occur in Pre-Cambrian formations in workable thickness and in extensive beds. Unfortunately at this place the cementing material is largely silicia instead of lime carbonate as in Alabama, so that the ores fail to be self-fluxing. The Hsuan Hua deposits, however, constitute one of the largest of the Chinese reserves and offer the distinct possibility of affording the basis for profitable smelting. In southern China, near Ping Hsing and Paoking, colitic iron ores occur in beds of the later Paleozoic. At Paoking they are reported to have a calcareous cement, but the only deposit yet found is small. In Kiangsi the colitic beds are siliceous and resemble closely the original greenalite rock of the Mesaba Range. Unfortunately the deposits are not extensive and no considerable amounts of ore have been developed from the parent rock.

4. Contact deposits: This is the most common and most promising type in China. To it belongs nearly all the known deposits of any considerable size in the Yangtze Valley from Tayeh to Mohing-Kuan, as well as the Chinlingchen ores in Shantung. The ores are mainly developed in younger Paleozoic rocks at or near the contact with intruding igneous rocks of the diorite family. Dr. Anderson suggests that the workable deposits are only found where the intrusive forms or has formed a laccolite. The ores include both hematite and magnetite. The ore bodies are irregular and hence difficult to estimate properly in advance of detailed prospecting. They are also subject to change of grade and in part contain sulphur to an annoying degree. The type does include, however, much high-grade ore.

5. Residual deposits: While no extensive laterite deposits have so far been found in China residual hematite and limonite ores occur. The Dong Ling Shan deposit in Kiangsi resembles the brown iron ores of the Southern States and in Fukien numerous small bodies of iron ore have been described as resting on or being found in the Red sandstone of the Mesozoic, which seems to represent concentration through weathering. The type is of small commercial importance.

PROPAGANDA AGAINST AMERICAN SHIPPING IN SOUTH AMERICA.

Source: Reliable.

Extensive propaganda is being conducted in South American shipping circles against American shipping. This propaganda is being carried on by foreign interests and by local agents who receive large commissions and bonuses for trade diverted from American lines. The substance of this propaganda is the inadequate and unreliable material in the vessels rapidly constructed during the war, which it is alleged is likely to lead to delay, damage, or loss of cargo. Stress is also laid in the propaganda upon the youth, alleged inexperience, and inefficiency of American merchant marine officers and seamen.

Whenever American naval officers come in contact with this vicious propaganda they should do whatever they can by way of interviews, addresses, and publications to refute and nullify this propaganda.

JAPANESE NAVY TO REDUCE EXPENSES.

Source: Reliable.

(12480.)

3 June, 1920.

In the supplementary budget to be introduced in the extraordinary session of the Diet the naval expenditure for the current fiscal year will be reduced from 66,298,000 to 44,298,000 yen. This decision was arrived at during a regular meeting of the cabinet held May 20.

In the budget introduced in the last session of the Diet, which was dissolved, the naval expenditure for the current fiscal year was estimated at 66,398,000 yen and it was intended to build a further 4 battleships, 4 battle cruisers, 12 light cruisers, and 37 destroyers, so that the 8-and-8 program that Japanese Navy men fancy so much might be completed by 1927. The total expenditure for the building of these battleships was estimated at 750,000,000 yen. It was further intended to extend the air corps, to establish a submarine school, and to build several more wireless stations at a further expenditure of 150,000,000 yen. As a result of the curtailment in the navy estimates a great deal of the proposed improvements and additions will have to be postponed until the next fiscal year.

JAPANESE NAVAL OFFICERS ORDERED ABROAD.

Source: Reliable.

(12487.)

3 June, 1920.

On the 8th of May the following officers were ordered abroad:

Engineer Lieut. Commander Kimpei Kajimoto, ordered to America.

Capt. Kuiji Hidaka, ordered to America and Europe.
Engineer Capt. Shunkai Maki, ordered to America and Europe.
Paymaster Commander D. Takagi, ordered to America and Europe.
Engineer Constructor Commander Tokiji Ishikawa, ordered to America and Europe.

OIL WELLS IN FORMOSA A FAILURE.

Source: Reliable.

(11671.)

3 June, 1920.

It has been reported on good authority that the oil wells sunk in Formosa by the Hoden Sekiyu Co. to a depth of 3,000 feet have been pronounced a failure, and no oil was discovered. However, the navy department has set aside about 400,000 yen to be used in carrying on the work of this company.

The oil wells that are being sunk by the Nihon Sekiyu Co. have reached a depth of 300 feet, but even at this stage it is said there exists no hope of discovery of oil.

BIG DOCK FOR KURE.

Source: Reliable.

(6799.)

3 June, 1920.

According to the Tokyo Asahi, Kure is planning a dock for the construction of a 40,000-ton ship. It will be constructed just north of No. 3 dock on the site of the present medical school.

As the water there is shallow, dredging is now going on, and it is expected it will be dredged out to the proper depth by the time the dock is finished.

The dock will be called No. 4 dock, and is said by the Japanese to be the biggest of its kind in the world.

LAUNCHING OF THE "MUTSU" (SUPERDREADNAUGHT) ON 31 MAY, 1920.

Source: Reliable.

(6797.)

11 June, 1920.

Launched at navy yard, Yokosuka, 31 May, 1920. Sponsored by her Imperial Majesty, the Empress.

Work of construction was started 1 June, 1917.

Ship was constructed and launched from building ways.

The *Mutsu* is sister ship of the *Nagato*.

Length, 661 feet.

Beam, 95 feet.
Draft, 30 feet.
Displacement, 33,800 tons.
Speed, 23½ knots.
Boats, 12.
Guns, eight 16-inch, twenty-two 5.5 inch (14 C. M.).
Torpedo tubes, 8 (21-inch underwater type).
Searchlights, 12.
Engines, 4 turbine.
Boilers, 21 Kanhon type (similar to Yarrow).
Propellers, 4.
Proposed crew, 1,336.
Protective deck armor, 9 inches.
Turret armor, 14 inches.
Side armor, 9 to 12 inches.
The *Mutsu* seems to have too little free board.

JAPANESE NOTES.

Source: Reliable.

11 June, 1920.

The *Kifuku Maru*, 10,000 tons, will leave Yokohama on 20 July for a round-the-world trip as a floating exposition. She will have on board all the chief products of Japan and will visit all the important ports of the world, returning to Japan in May next year.

On 5 June a severe earthquake struck Formosa and did a great deal of damage. A few deaths are reported.

On 7 June some lighters, loaded with gasoline, caught fire in Kobe Harbor, and a damage of over a million resulted. Three lives were lost. The lighters got adrift and did a slight damage to two ships in the harbor. Several ships shifted their anchorage and avoided contact with the lighters.

Negotiations have been going on for exchange of envoys between Japan and the Vatican with a view to closer relations.

EFFECT OF FINANCIAL DEPRESSION ON SHIPBUILDING AT OSAKA IRON WORKS.

Source: Reliable.

(7410.)

11 June, 1920.

Information received on 27 May from the Osaka Iron Works indicates that the company has very few contracts in hand and nothing in prospect, except tankers for the Japanese Navy.

Estimates are being made for the navy department for one or two more tank steamers, moderate size.

The 16 trawlers, equipped with a very large winch forward, a large winch aft, and one special iron outrigging davit well aft on each side, were completed about the 10th of May, and have left the Osaka Iron Works.

NEW JAPANESE DESTROYERS.

Source: Reliable:

(9324.)

11 June, 1920.

The destroyer *Yakaze*, which was built at the Nagasaki Works, underwent her first trial trip on Wednesday, June 9. She was built by the Mitsubishi Co.

Another destroyer of similar type will be launched on June 21.

ARMY FIELD NOTES.

Source: Reliable.

Aeroplanes.

Aeroplanes must rely upon infantry to prevent the enemy from overrunning aerodromes.

Cavalry.

It has been proved that cavalry, whether used for shock effect under suitable conditions or as mobile infantry, still plays an indispensable part in modern warfare. During the German offensive of 1918 the superior mobility of cavalry fully justified their existence. Had the German command had at their disposal even two or three well-trained cavalry divisions, a wedge might have been driven between the French and British armies.

Tanks.

Tanks require heavy artillery support to counteract enemy artillery, and need infantry to hold positions gained.

SHIPS—AUSTRALIA.

Source: Reliable.

The six destroyers presented by the Imperial Government have arrived at Sydney:

Flotilla leader, *Anzac* (three screw, 1,650 tons, oil, 34 knots, four 4-inch guns, two 2-pounders, four 21-inch tubes, Kempenfelt class).

Stalwart, *Success*, *Swordsman*, *Tasmania*, *Tattoo*, S class.

This gives Australia 12 destroyers total.

Sailors—Australia.

The enlistments in the Australian navy are to be for 12 years instead of 7.

BRITISH NAVAL BASE AT TRINCOMALEE.

Source: Reliable.

6 May, 1920.

The British Admiralty has reestablished the port of Trincomalee as the chief naval base of Ceylon. During the war the port of Colombo was used as the principal base. The senior officer has taken up his permanent residence at Trincomalee.

MUNITIONS—NITRATES—POSSIBLE PRODUCTION (GREAT BRITAIN).

Source: Reliable.

A contract has been arranged whereby a syndicate comprising Messrs. Brunner Mond & Co. (Ltd.) and Explosives Trades (Ltd.) are to purchase an extensive site belonging to the Government and to build there a nitrogen factory; capital to be £5,000,000. Haber-Le Rossignol method of causing nitrogen and hydrogen to combine into ammonia at high temperature and pressure—ammonia then into nitric acid for explosives or fertilizers.

EMPLOYEES AT ROYAL DOCKYARDS.

Source: Reliable.

The number of employees in Royal Dockyards at Portsmouth, Devonport, Chatham, Sheerness, and Pembroke on August 1, 1914, was 46,805; on April 1, 1920, 53,679. The number discharged from armistice up to April 24, 1920, was 21,738.

MUNITIONS (FRANCE).

Source: Reliable.

The French have a new powder, two types:

(*a*) Bis tamise (twice sifted).

(*b*) 1 mm. leaflets running 10,650 to the gramme.

OPERATIONS.

NOTES ON GRAND FLEET DESTROYER PROCEDURE.

(For issue to destroyers not attached to the Grand Fleet in the event of a concentration being ordered.)

Source: Reliable.

Cruising.

(*a*) The Grand Fleet when cruising is screened by the flotillas attached to the fleet.

Any flotillas joining from southern waters for concentration purposes will usually, when cruising, be kept together as a flotilla and stationed by signal in a position about 45° from right ahead and 4 miles distant from each of the wing battleships divisions.

Fuel is to be economized when on passage with the fleet.

In the event of the fog-emergency disposition signal being made the flotillas are to form 4 miles on the beam of the wing battle squadron.

Deployment.

Destroyers must not hamper the movements and firing of heavy ships. If the battle fleet should alter course toward the enemy (a probable procedure) destroyers must at once conform to the movement.

On deployment, the flotillas from southern waters joining the Grand Fleet are to take station ahead and astern of the main battle fleet on their respective flanks and on the disengaged side of the main battle-fleet flotillas. These flotillas at the van are usually stationed 4 miles ahead of the leading ship of the main battle fleet, and about 2 miles ahead of the Fifth Battle Squadron (consisting of 4 ships of the *Queen Elizabeth* class); and at the rear about $2\frac{1}{2}$ miles astern of the rear battle squadron of the main battle fleet.

Action.

British flotillas, in high visibility, and being in a favorable position, commence the attack as soon as, but not before, the heavy ships are engaged. In low visibility the attack is commenced at the earliest opportunity.

Flotillas on the disengaged side of other flotillas move into positions vacated by main battle-fleet flotillas as soon as the latter have commenced to attack.

If the advantage of torpedo position is with the enemy, British flotillas should concentrate on breaking up any enemy flotilla attacks.

In attacking enemy flotillas destroyers should get close, so that every projectile may hit. Care must be taken not to pass within destructive gun range of the enemy's line unless the enemy is heavily engaged.

Funnel smoke must be reduced to a minimum in order not to impede the fire or hamper the view of our ships.

After Action.

(*d*) Certain destroyers selected from Grand Fleet flotillas and from the Harwich force will be detailed for night attack on the enemy. The remaining destroyers, and these will probably include destroyers which have recently joined the fleet from the south, are to form half flotillas as quickly as possible, with the object of acting against enemy torpedo attacks during the night and against submarine attack at daylight. Destroyers unable to joint their own flotilla are to form on the nearest leader or half leader, the commodore (F) or senior captain (D) equalizing the strength of half flotillas. It is important that all destroyers should be attached to a leader or half leader before dark, and that they should be given their reference positions, together with the course and speed of the fleet, during the night.

Miscellaneous Notes from Grand Fleet Flotillas General Memoranda Reports Required After an Action.

A list of reports required after an action is appended. It is imperative that these reports be rendered immediately.

Reports from destroyers are to be rendered through the respective captains (D), but if it is thought that the reports will be delayed by sending them to the captain (D), owing to his absence from base, etc., they should be sent to commodore (F), who will supply the captain (D) with a copy.

Blank reports should be reported by signal if in company, or by telegraph if detached.

Reports Required After an Action.

Subject.	Authority.	Remarks.
(1) Report of proceedings		To reach commodore (F) in triplicate.
(2) Recommendations of officers and men.		To reach commodore (F) in triplicate. All names to be in full. Official numbers and port division to be inserted.
(3) Torpedoes and ammunition expended.		To reach commodore (F) in duplicate.
(4) Torpedoes fired at or by enemy.	C. M. O. 3522/1917	Do.
(5) Casualties	A. M. O. 184/16	By telegraph direct to Admiralty. Destroyers through respective depot ships.

State of Readiness for Action in Destroyers.

(1) When not more than the ordinary chance of meeting the enemy exists:

Guns.—One gun manned (selection dependent on weather).

Torpedoes.—Tubes fore and aft. Pins out, fans lashed. One higher torpedo rating and one with headpiece on.

(2) When more than an ordinary chance of meeting the enemy exists:

Guns.—All guns cleared away and whips rigged. One gun manned.

Torpedoes.—Tubes fore and aft. Pins out; fans lashed; two men at each tube.

(3) When a probability of meeting the enemy exists:

Guns.—All guns manned; boxes open; clips off cartridges; lyddite pins out; small arms served out.

Torpedoes.—Tubes trained on either beam; charges in; pins out; fans lashed.

NOTE.—The above is to be considered as a guide dependent upon weather, visibility, and whether night or day.

It is not considered advisable to have tubes trained in bad weather or when there is a danger of hitting our own ships, in case of accidental discharge.

Searchlights should be manned at night.

It should always be remembered that the early dawn may reveal the presence of the enemy.

Destroyers Working with Hydrophone Trawlers.

Destroyers working with hydrophone trawlers are to keep well clear of them. A distance of about 8 to 10 miles is sufficient, and this would still enable the destroyers to support the hydrophone force fairly quickly.

It is not desirable that destroyers should remain stopped in the vicinity of trawlers, owing to the danger of submarine attack.

Destroyer Full-Caliber Firing.

To get the maximum value out of the limited supply of ammunition available it is most important that:

(*a*) Permanent elevation and flash record parties be told off in the depot ships and changed as little as possible.

(*b*) Each destroyer should detail and train their own firing ship record parties, which should include direction record.

It should be realized that recording becomes increasingly difficult as the destroyers improve their rate of fire.

With the particulars obtained by these parties, analysis of the firing is to be made out by the ships' officers on *Form S 1155b*, and forwarded to the commodore (F).

To insure uniformity, the following procedure is to be adopted:

(*a*) Plot fall of shot for elevation and direction.

(*b*) Draw in transmitted range curve. It is most important that this curve be honestly drawn in.

It is the keystone of the whole chart.

It should be drawn as a series of straight lines between the various points.

(*c*) Enter deflection on sights in columns provided.

(*d*) Put in spotting corrections graphically above the transmitter curve, and against this curve also enter deflection spotting. *All* orders given to the guns are to be entered on the spotting curve under the time at which they were given, viz, "Shoot again," "Independent," "Rapid salvos," etc.

(*e*) "Rate used" curve is found by laying off downward from any datum line the distance from spotting curve to transmitter curve.

(*f*) True rate curve is found (i) by measuring the distance of M. P. I. of each salvo from target line: (ii) laying this off from transmitter curve in the opposite direction.

(*g*) The times of firing torpedoes are to be entered on the chart.

Notes on the Charts.

The same scale *must* be used throughout for elevation, spotting, rate used, and true rate curves.

All dots to be of the same color—do not trouble to distinguish individual guns.

Any sight difference for range to be marked against transmitter curve as a dot and noted.

Breaks in the sweep of the "rate used" curve show clock errors.

A rough plan of the run is to be given on the back of the chart.

A brief account of the firing, explaining the difficulties experienced by the control officer and range-finder operator, is to accompany the chart, giving also their names and date of assuming duties.

The causes of delays at the guns are to be fully entered on the chart.

These reports are to be countersigned by the captain.

Description of Fire Probable in a Destroyer Action.

(1) Single ship, (2) subdivisional, (3) divisional, and (4) massed or barrage fire by two divisions or more.

Subdivisional Fire.

A subdivision engaging a single enemy. The rear ship must subordinate his fire to the leader. The leader should pass his range and deflection, but there should be no difficulty in each ship spotting his own salvos.

Divisional Fire.

A divisional leader, wishing to concentrate his division on one ship of the enemy, will hoist signal 95 (flags) with a counting signal inferior. The division must then implicitly obey the spotting and control of the leader, firing either salvos or rapid independent.

Massed fire of a large number of destroyers comes under the same conditions as massed fire of a division, and all ships must implicitly follow the spotting corrections of the leader so long as their guns are laid on the same object.

Barrage Fire.

Should the occasion and opportunity offer of a concentrated attack being carried out by a number of destroyers with the intention of quickly stopping an enemy flotilla advancing to attack our battle fleet with torpedoes:

The leader intending to employ barrage fire hoists AFT (all fire together), and turns all available destroyers toward the enemy.

When he judges he is at a range of 8,500 (with present destroyer sights) he will hoist 5 flag. All destroyers are to set their sights at extreme range (7,800) and concentrate on the enemy's destroyers nearest to them.

As soon as the enemy appear through the fire zone the leader will come down 500 or 1,000 yards, according to the rate of approach, making the range by "sceptre" and repeating it by W/T, thus: "Union 68" indicates "range 6,800." All destroyers should repeat on the "sceptre" system.

At 4,000 yards the object of "barrage" fire will cease. The enemy may then be expected either to turn up on a parallel course or come on. In either case, unless he has much superior speed, we should soon be on top of him and at point-blank range.

Hydraulic Release Gear for Depth Charges—Possible Failure Of.

During very cold weather one or two cases have occurred in which the depth charge release gear has failed to act, due to the glycerine and water mixture solidifying, through spray freezing on the pipes.

The depth charge release gear is to be frequently examined when the atmospheric temperature is below freezing point. The actual temperature quoted in *C. B. 1334* must not be relied on.

Torpedo Tubes and Combined Sweep Fittings—Precautions to Be Taken in Cold Weather.

When the temperature of the air is below 40° F. the steam-heating gear of torpedo tubes is to be kept in use. One boiler is to be lighted up as necessary for this purpose.

Special precautions must be taken when steam is shut off winches and tube-heating gear to thoroughly drain all pipes and cylinders.

In order to allow exit for any water that may get into cylinders owing to a slight leak in steam or exhaust valves, the cylinder and slide covers are to be slacked back.

The engine drains being open ended would freeze up first and so prevent drainage.

The correct mixture of glycerine and water must be used in the depth-charge release-gear system.

If (owing to the time it would take to prepare the torpedoes for service again) it is not considered desirable to drain all the liquids out of the torpedoes while boiler cleaning is going on, bogies must be placed under the tubes to keep them warmed, as the steam-heating gear takes a long time to thaw a torpedo which has frozen up.

Use of Torpedoes Against Submarines.

Although it is necessary to economize the use of torpedoes, destroyers employed in hunting submarines should be ordered not to lose any really favorable opportunity of using their torpedoes against submarines when their periscopes are showing and they are not sufficiently exposed for gunfire to be effective.

The torpedoes should be kept set for a depth of 23 feet and ready for instant use.

The effective ranges from which torpedoes should be used against submarines are from 200 to 600 yards. Within 200 yards the torpedo can not be relied upon to be at its proper depth and beyond 600 yards the chances of hitting would be small.

The enemy's speed bar on the director should be kept set for five knots, and the course estimated either by the wake of the periscope and the wash of the submarine or by judging the object the submarine is making for.

Only one torpedo should be fired at a time, and the result noted before firing a second, should the opportunity continue to be favorable. (R. A. H. F. J. of I. No. 20.)

Torpedo Warheads.

Before entering basins or docks warheads are to be removed from torpedoes in tubes.

Torpedo impulse charges are to be removed from the cartridge pockets of torpedo tubes before entering harbor, and are not to be replaced until the ship is outside harbor. The fact that this has been done is to be reported to the commanding officer on each occasion, and a notation is to be made in the ship's log to that effect. (R. A. H. F. J. of I. No. 20.)

Testing of Air Service Pressure Gauges.

Several cases have occurred recently of the air charges used on practice runs of Whitehead torpedoes being higher than intended, and on one occasion a torpedo was lost as the charge did not give positive buoyancy at the end of the run. The excessive air pressures used were found to be due to the fact that the pressure gauges were inaccurate.

Attention is called to the necessity of frequently checking the accuracy of pressure gauges by comparison with a standard gauge. The pressure gauges supplied for use with destroyers are to send these gauges on board depot ships to be compared with a standard gauge on every occasion of boiler cleaning.

Lieutenant Commander (P. V.)—Grand Fleet Flotillas.

A lieutenant commander is borne on the staff of commodore (F) for P. V. duties with the Grand Fleet flotillas. His duties are:

(*a*) To carry out tests of new P. V's.

(*b*) To inspect cases reported of bad running.

(*c*) To advise captains of destroyers as to the position of fixtures, etc.

Captains (D) requiring the services of the lieutenant commander (P. V.) for any of the destroyers under their orders should apply to commodore (F).

Torpedoes Running Abaft the Line of Fire.

As a result of trials carried out in destroyers *Tormentor* and *Woolston* it has been found that, with the destroyer steaming at about 25 knots, torpedoes fired from "close-fit" tubes run a small amount abaft the line of fire, but that the error is barely noticeable with torpedoes fired from "slack-fit" tubes.

The general results of the trials may be summarized as follows:

Close-fit tubes, i. e., 21 inches D. R., A. W., tubes marks II or III.

(*a*) Ships not under helm, steady course. Maximum error observed 10° *abaft;* mean error observed 5°.75 *abaft.*

(*b*) Ship under helm turning *away from* target. Maximum error observed 10° *abaft;* mean error observed 7°.5 *abaft.*

(*c*) Ship under helm turning *toward* target. Maximum error observed 2°.9 abaft; mean error observed 2°.7 *abaft.*

Slack-fit tubes, i. e., 21 inches T. R., A. W., tube mark I, or D. R., A. W., tube mark IV.

(*a*) Ship not under helm, steady course. Maximum error observed 4° before line of fire; mean error observed 1° before.

(*b*) Ship under helm, turning away from the target. Maximum error observed 3° *abaft;* mean error observed 8° abaft.

(*c*) Ship under helm, turning toward target. Maximum error observed 2° *before;* mean error observed 1° before.

NOTE.—Allowance has been made in the above results under conditions (*b*) and (*c*) for the swing of the ship during the time interval from the instant of pressing the firing push to the instant at which the gyroscope is freed from all constraint.

If allowance is not made, the swing will reduce the error under condition (*b*) by about 1½° and will increase the error under condition (*c*) by a like amount.

The reasons for this running off the line of fire are not yet definitely ascertained, but it is believed that the antitoppling effect of the air drive upon the gyroscope while the torpedo is rolling heavily and deflecting at the commencement of its run is the principal cause.

The amount of error is apparently closely connected with the angle of entry into the water of the torpedo, the error being smallest when the angle is flattest. This is to be expected, as the deflection is least when the entry is quite flat.

The best conditions for firing, from this point of view, are with the destroyer turning *towards* the target, i. e., heeling away from the target, as the tube is then inclined up and torpedo falls flatter. With slack-fit tubes the torpedo may even fall into the water tail first, when it will be deflected forward and may be expected to run slightly before the line of fire.

Unfortunately the usual conditions during an attack are that the destroyer is turning away from the target, the tube is inclined down, the angle of entry is comparatively large, and consequently the error may be expected to be large.

In vessels carrying " close fit " tubes, i. e., 21 inches double revolving A. W. tubes, Marks II and III, the mean error is to be taken as 5° abaft the line of fire and, to counteract this, directors are to be set to " bearing of tube " 95° when the tube is actually at 90°.

In vessels carrying slack-fit tubes, i. e., 21 inches triple revolving A. W. tubes, Mark I, the double revolving A. W. tubes Mark IV, no alteration should be made to the setting of the director at present.

Further trials will be carried out with slack-fit tubes also with close-fit tubes when 15 ounce charges are supplied.

Time on Aim Practice for Searchlights.

The following exercise is recommended for use in daylight hours:

The ship burning the searchlight endeavors to keep it laid by the manipulating gear on a particular point of the target ship for a continuous period of ten minutes. The target ship records by stop watch, the time during which the searchlight was accurately laid, and signals the result as a percentage at the expiration of the ten minutes.

To enable the ship burning the searchlights to know when her light is well laid, the target ship should show a prearranged signal (from

the point of aim position) all the time that the searchlight is accurately laid on her.

Only time when searchlight is accurately laid should count. A little practice will enable the target ship to discriminate between this and the time when the searchlight is first off, but with the illuminated mirror still showing.

Care is necessary to insure that searchlight beams are at parallel focus and not spread, which would make the keeping "on" easier.

Daily Loss of Air Pressure in Torpedoes.

Records have recently been obtained in several destroyers of the loss of air from the air vessels of torpedoes kept ready for instant action, i. e., with stop valves open and charged to full pressure.

The average daily loss of air was 40 pounds per square inch, approximately, but the results varied considerably, the maximum loss recorded being as much as 250 pounds per square inch in 24 hours and the minimum no loss at all in five days.

It is very noticeable that the loss of air in torpedoes on board the same destroyer was approximately the same, which points to the fact that the loss of air is dependent upon the care which is taken by the personnel to keep the torpedoes in good condition.

In two destroyers the average daily loss for all torpedoes was only 3 pounds per square inch, a very creditable record.

As any loss of air means a reduction of the range the torpedo will run, commanding officers of torpedo-boat destroyers must impress upon their torpedo officers the necessity for keeping their torpedoes in perfect condition, and they should not be satisfied until the leakage reaches the standard set by the two destroyers mentioned above.

In this connection officers are reminded that the pressure *for action only* is 2,500 pounds per square inch for torpedoes whose maximum pressure for exercise is 2,350 pounds per square inch; 2,650 pounds per square inch for torpedoes whose maximum pressure for exercise is 2,500 pounds per square inch.

Torpedo Running—General Rules.

When practice running is carried out with torpedoes a properly organized exercise is to be carried out whenever possible and, except when carrying out test runs with new torpedoes or torpedoes which have been parted after doing an unsatisfactory run, a moving target is always to be used when available.

Depth and roll recorders are to be used whenever they are available. They should not as a rule be opened up in the destroyer, but sent back to the depot ship to be analyzed, with a report of the runs. Runs at H. S. setting, failures, bad runs, and runs of any particular interest

should be forwarded to commodore (F) by captains (D) for forwarding to H. M. S. *Vernon*.

Whenever a moving target is used, Form S. 318 is to be sent in to captain (D) and any of these which may be of interest should be forwarded to commodore (F). The torpedo control officer of the torpedo boat destroyer should also plot the result of the shot and forward the plot to captain (D). In the case of flotilla exercises, the torpedo control officers should assist the flotilla torpedo officer in plotting the results.

When a torpedo does a bad run, the commanding officer of the destroyer is to investigate the matter as soon as possible and forward a report to his captain (D) without delay. Whenever possible, the flotilla torpedo officer should be present at the investigation.

If it is considered necessary to return the torpedo to the depot ship for parting, this should be done as soon as possible but, if the fault can be found without this, the torpedo should as a general rule, be run again when the apparent defect has been made good.

There is no excuse for the loss of a torpedo through the stop valve not being opened. All losses due to this cause are to be dealt with by a court of inquiry, and disciplinary measures are to be taken if blame is attributable to any person.

Every possible opportunity is to be taken to carry out A. U. attacks firing torpedoes, either between divisions of destroyers or by arrangement with big ships. Results of these exercises should be plotted from records as soon as possible after the event, for the information of all concerned.

Records During Torpedo Tactical Exercises.

In order that permanent records may be available for reference and instruction, it is very desirable that movements during torpedo attacks carried out by a flotilla of destroyers upon a fleet or squadron in the open sea, under conditions approximating to those in action, should be plotted.

The principal difficulties encountered in plotting results are (i) to obtain definite positions of divisions during the attack and (ii) to make the times recorded by different vessels agree.

It is fully realized that the keeping of records in destroyers during an attack is difficult, and the following arrangements are planned with a view to reducing the records required as far as possible, and on the assumption that leaders and half leaders have a navigating officer who will usually be able to take bearings.

When an attack is carried out the following procedure for obtaining good records should be carried out:

(*a*) Watches should be synchronized before the exercise.

The senior officer of the attacking force should make a time ball signal for this purpose, and should also compare his own time with that of the senior officer of the target line.

(*b*) Flotilla leaders and half leaders should record their positions relative to target line at intervals.

Positions by cross bearings of big ships, if obtainable, are best; otherwise positions by bearing and distance.

(*c*) Any *good* ranges obtained should be recorded, as these are of great assistance toward plotting.

(*d*) Flotilla leaders and half leaders and divisional commanders should keep a very careful record of the courses steered and distance run on each course.

(*e*) 1. The flotilla leader should record the formation of the flotilla occasionally.

2. Divisional commanders should record their distance and bearing from flotilla leader and the formation of their division occasionally.

(*f*) 1. All attacking vessels should fill in the torpedo control Form S. 318 at the time of firing.

NOTES.—1. Bearings in (*b*) and (*e*) 2. should be taken while the ship is on a steady course, if possible, to avoid errors due to lag of compass.

2. Accuracy of records is of the *greatest* importance. When the accuracy of any information recorded is doubtful the fact should be stated.

3. Torpedo control officers should verify the statements on Form S. 318 and see that the bearings recorded agree approximately with the deflection actually used. The most accurate item of information should be specially denoted.

Torpedoes—Tendency to Miss Ahead.

It has been observed that in recent exercises the torpedoes fired by single torpedo-boat destroyers attacking divisions of battleships frequently passed ahead of the line, sometimes a considerable distance ahead. In these exercises the torpedo-boat destroyers and battleships were on *opposing courses.*

This tendency to miss ahead is due to the combination of several errors which result from—

(I) Overestimation of the inclination, i. e., the observer tends to think he is nearer the beam of the target than he actually is.

(II) The fact that a torpedo runs faster than its stamped speed during the early part of the run. This is the case whether the torpedo is in action condition or when small air charge and light head used as in practice.

(III) Anxiety on the part of torpedo control officers not to miss their opportunity of firing, resulting in firing early.

(IV) Torpedoes running a few degrees abaft the line of fire.

When attacking on an opposite course the errors due to the above are cumulative. The easiest way in which to counteract this tendency is to shift the point of aim aft, and it is therefore recommended that when attacking a division of battleships on opposing courses the point of aim should be the last ship of four or five ships.

When attacking on approximately parallel course, the errors above will counteract each other, and it is probable that the center of the line is the best point of aim.

The tendency to miss ahead is well known, and is drawn to the attention in the Handbook of Torpedo Control, 1916, page 53, under Rule III, for setting sights by estimation.

Overhaul of Torpedoes.

Torpedoes which are kept continuously at the ready should, if possible, be overhauled every six months, but if this entails rushing the overhauls or carrying them out with insufficient care and supervision, the time may be allowed to be longer, but should not exceed nine months.

As torpedoes are not necessarily parted after running, "blowing through" is a matter of the utmost importance, and on no account must the routine laid down be shortened. It is frequently necessary to run the engines for longer periods than are laid down, in order to clear the torpedo of the water and fuel and to lubricate the engines thoroughly.

Sinking Ship in an Emergency.

The following steps should be taken in engine and boiler rooms with a view to sinking a damaged ship, should such a course be necessary to prevent her falling into the hands of the enemy:

(*a*) *Engine room.*—Remove weed trap covers in main circulating inlets.

(*b*) *Boiler rooms.*—Remove caps for flexible hose connections and open boiler blowdown to sea valves.

FOG.

(a) General.

Any destroyer losing touch with her next ahead should steer a steady course and speed until a further signal is made.

Care must be taken to use small helm when following in the wake of the next ahead.

Every means, such as searchlights, yard-arm groups, and—when speed permits—fog buoys, should be used to assist in station keeping when with the fleet.

When fog is seen coming down captains (D) are to hoist the vocabulary groups for "Preparative fog." As soon as this signal is seen destroyers are to form as previously arranged.

In cases where it is not suitable to form in any of the cruising orders captains (D) should arrange temporary divisions and formations so that should fog be imminent their flotillas can be readily formed up by signal "Preparative fog."

Destroyers are, however, to close up whenever they see fog coming without waiting for orders; screen can always be reformed should the fog not develop.

(b) When Steaming in Company but Not with the Fleet.

If conditions permit and there are not more than five destroyers present, they should be formed in single line ahead. If there are more than five destroyers present they should be formed in No. 1 cruising order.

NOTE.—When fog is very dense, captain (D) and half leader should lead one line of their half flotillas with columns at two cables apart.

The senior officer of the flotilla should reduce the speed of the flotilla as soon as possible.

Temporary Order XXVIII—Fore Bridge Torpedo-Firing Gear.

In ships fitted with fore bridge torpedo-firing gear the drill regarding the removal of the pistol safety pin is to be amended to read "the pin is removed on the order 'starboard (or port) beam,'" being given.

Temporary Order XXXIV—Sinking Ship in an Emergency.

With reference to F. G. M. E/14 the following extracts from an Admiralty letter on the subject of sinking a destroyer to prevent her falling into the hands of the enemy are communicated.

Extract.

It is considered that the use of explosives of some nature, if at all practicable, should be adopted, especially if rapidity of scuttling is aimed at. The time taken to scuttle a destroyer in general is bound, on account of its shallower draft and large reserve of buoyancy, to be more than is required in the case of a larger vessel.

The most effective position for the explosives would be in the vicinity of lower deck at bulkhead 139. (Admiralty are referring to "V" class.) By removing all lower deck scuttles to compartments from 126–154, opening up upper deck scuttles and destroying ship's side and lower deck at 139 station by explosives, it is estimated that in conjunction with flooding the machinery spaces the vessel would founder by the stern.

With reference to the type of explosive to be used it appears to their lordships that a type "G" charge, of which there are very many to spare, would be more certain in effect than a 16½-pound tin. Priming would be done in the same way. It is not considered advisable to keep *primed* charges in position as suggested in view of the risk sabotage. The following is recommended:

(*a*) Type "G" kept in position.

(*b*) Two-and-a-half-pound tin permanently fitted with a 1-pound primer detonator and Bickford's fuse, the whole in a tin with tear-off strip, stowed elsewhere in two positions in duplicate.

(*c*) Two-and-a-quarter-pound tin filled dry gun cotton in two positions in duplicate adjacent to (*b*).

Even if the 1-pounder does go off the damage would not be serious. All should be locked up, and opened only at "Action Stations."

The steps to be taken in engine and boiler room as laid down in P. G. M. E/14 are to remain in force in addition to the above.

The necessary stores should be demanded.

Temporary Order XXXV—Attacking Submarines by Depth Charges.

Destroyers are now supplied with an increased number of depth charges, and in some cases with depth-charge throwers, so that in the event of one or more destroyers sighting a submarine it is an easy matter to cover a considerable area with depth charges if they are dropped systematically.

If a submarine is sighted when two or more destroyers are in company, the destroyer which first sights the submarine is to proceed at utmost speed, with the intention of ramming, or, if the submarine dives, of dropping depth charges.

The question of seniority must be waived. It is of vital importance to act instantly.

Destroyers should *not* open fire *at long range*. The chances of hitting are very small, and it is always possible that the submarine may not have seen the destroyer.

Fire should be opened when it is certain the submarine has seen the destroyer or when at close range.

The destroyers in company are to form on each beam, if possible, or, if not, on the quarter of the destroyer which leads the attack, and it is up to them to keep clear of her in order to avoid being damaged by her depth charges.

The attacking destroyer should drop a mark buoy with sinker on the spot where the submarine was last seen as a guide to the remainder, who will drop their depth charges on each side of the target, as it is presumed a submarine after diving will either go straight to the bottom or turn about 8 points one way or the other.

If each destroyer drops a line of depth charges and also fires her depth-charge throwers, the area covered will (in the event of the submarine having been within 4,000 yards when sighted) be considerable and should lead to her destruction.

No opportunity of ramming a submarine should ever be missed. Ramming is the only absolutely certain method of definitely sinking a submarine. There are occasions when ramming is unnecessary, such as the crew of a submarine being on deck with the white flag up and obviously desirous to surrender, but even on these occasions it is quite certain that the crew of the submarine will have made arrangements for the destruction of their ship and that, consequently, salvage will be impossible; or again, it is possible they may change their minds.

Therefore it is considered that the use of the ram is justifiable under all conditions.

When destroyers are forming a screen for heavy ships the senior officer must be guided by the strength of the screen the operation on which employed, and the certainty or otherwise of the position of the enemy submarine, as to whether it is justifiable to leave the squadron in order to attack as described in paragraph 4, clauses 2 and 3.

Under normal conditions, however, the attack must be pressed to the utmost even if the screen is temporarily weakened, and every endeavor should be made to destroy the submarine.

Temporary Order XXXVI—Mines, Sinking of.

When in company with the fleet, and especially when enemy craft may be within hearing of gunfire, it is not permissible to sink floating mines with 4-inch guns.

When a mine is sighted ahead of the fleet the destroyer sighting it should hoist the mine flag and remain in the vicinity until the fleet has passed, endeavoring to sink it by rifle fire, 1 inch or pom pom.

Gunnery Courses for Destroyer Officers.

With reference to C. M. O. 2996/18, the following arrangements have been made for gunnery courses at *Port Edgar:*

The gun-control officer is to be qualified under two headings:

(I) The result of (*a*) his ship's "single ship practice," of (*b*) a firing course of 40 rounds.

(II) A course of lectures and practical stripping carried out at *Port Edgar* in accordance with the syllabus shown in paragraph 13 of this order.

On the completion of the exercise month captain (D) will submit the names of the gun-control officers whose two shoots have been

satisfactory and who need not, therefore, do the firing course. These officers, together with other recommended officers, will then be available for forming into a G class. A series of lectures will be given in *Port Edgar* covering the subjects of the syllabus, and those officers who have not fired satisfactorily during the exercise month will, in addition, fire 40 rounds.

The difficulties of the continuous attendance at the lectures will be partly met by a scheme of "lettered lectures" extending over a fortnight, at which each officer must put in an attendance; should he miss a lecture, an opportunity during the next fortnight must be taken.

Selected officers from flotillas other than reserve flotilla may also be detailed by their captains (D). Opportunities to attend the course occur also when ships are in hand for repairs, etc.

The lectures are lettered and a record of attendances at each lecture will be kept. Since the exercise month occurs every four months, each control officer will have an opportunity of passing in lectures during this period, and any new control officer would also have a chance of *qualifying within four months.* Officers who may have satisfactorily passed in the lectures at *Port Edgar* can finish the course by carrying out the firings later.

Captains (D) are requested to arrange for all available officers besides the gun-control officers to attend the lectures.

The first lieutenant of a destroyer doing duty as T. C. O. should attend lectures in order that he may be in a position to supervise the routine of care and maintenance, gun drill, control drill, generally. No examination.

The first lieutenant of a destroyer not qualified by "Excellent" (but carrying out gun-control duties) attends the lecture course, firing course, and examination.

The first lieutenant of a destroyer qualified by "Excellent" carries out the two shoots if not done in "Excellent." No examination.

The sublieutenant not qualified in gunnery control by "Excellent," carries out the firings and course. Examination.

The sublieutenant qualified by "Excellent" carries out the firings (if not done in "Excellent"). Examination.

Syllabus of Course.

A. (Stripping.) To be able to strip and assemble 4-inch A. F. and 3-inch H. A. breech and breech mechanism; pom-pom buffer and lock; 4-inch A. F. firing mechanism. To be able to adjust training gear 4-inch P. IX and remove roller C. P. II. To have a thorough knowledge of jambs in 4-inch Q. F., 3-inch H. A., pom-pom, and Maxim, and how they can be cleared in action.

B. (Spotting table.) To be able to carry out the duties of control officer; to be able to carry out the duties of, and instruct, rate keeper, clockworker, voice-pipe number, rating in charge, and time of flight operator.

C. (General gunnery.) Including a knowledge of the following: Responsibility of the first lieutenant for the armament, its care and maintenance. Instruction of guns' crew and control parties; organization; training; daily tests of instruments; control drill; oil chart; test of liquid; slip trials and pom-pom run out; prepare guns for firing (parallelism of sights); recording parties, their duties and organization; instruction of gun layers and trainers (at sea with motion on ship); the necessity of drill being automatic.

D. (Director firing gear.) To include a knowledge of the various instruments and their care and maintenance; to understand the "convergence" of the instruments at the guns and the mechanical elevation gear.

E, K. (Gun drill.) To be able to perform the duties of, and to instruct all numbers at 4 inches Q. F., 3 inches H. A., and pom-pom gun drill.

F. (Director tests.) To know what tests are required both when setting up and periodically. To be able to carry out a convergence test and to line up black and red pointers; to know how to make the A, B, and C adjustments to the Henderson gear.

G. (Range tables.) To know how to use the range tables, including the H. A. table; to understand the use of time of flight; to know the precautions necessary before testing sights; to be able to determine if a sighting telescope is faulty; general knowledge of high-angle control.

H. (Ammunition.) A general knowledge of the ammunition supplied to destroyers, the regulations as to its stowage, preservation, and testing; the forms and records required in connection with it.

J. (Sight testing to carry out a practical test of sights.)

L. (Gunnery records, etc.) To be able to make an analysis of a firing; to know how to keep memos of gun examinations, cordite test and magazine temperature forms, gunnery logs; to have a general knowledge of the use of C. I. O.'s, C. M. O.'s, K. R., and A. I.'s.

M. (Nature of fire.) To know the methods of carrying out control of subdivisional, divisional, and barrage firings from destroyers and when they are likely to be of use.

(In addition to above.) Practical instruction in controlling 1-inch firing for half day in a destroyer, and two days for full caliber firings in a destroyer.

Examination (1 Day).

	Max. marks
General gunnery and stripping	25
Director, director tests, and sight testing	25
Nature of fire, range tables, analysis	25
Gun control, gun drill, ammunition	25

The firing charts will be examined by a commander (G).

An officer must obtain 60 per cent in *viva voce* and 60 per cent in his firings to quality.

An officer who fails in examination is not allowed to quality for a further three months.

TORPEDO ATTACKS BY DESTROYERS ON ENEMY HEAVY SHIPS.

Commanding officers of destroyers must use their own discretion as to the number of torpedoes to be fired, which must be dependent upon the suitability of the occasion—two torpedoes for certain *and all if the conditions are favorable.*

When attacking the enemy's battle fleet it should be borne in mind that their speed may be as much as 21 knots if their second squadron is absent.

If the second squadron is present, the speed is not likely to be more than 19 knots.

In cases where the visibility and circumstances are such that the enemy's fleet may be expected to be sighted *within torpedo range* the flotilla should be in flotilla cruising orders, No. 6 or 7 (not included).

Method of attack No. 2 is intended for use at night or in misty weather, when a flotilla may be suddenly confronted by a fleet or squadron ahead, or nearly so.

The flotilla must attack with the utmost rapidity or destroyers will be sunk by gunfire. It is probable that if the whole flotilla turned one way in this attack the enemy would turn in the direction which would place the destroyers abaft the beam. The flotilla should therefore split, thus insuring half a flotilla being in position to attack whichever way the enemy may turn.

Success depends on prompt action on the part of commanders of divisions, who should turn outward at right angles to the bearing of the enemy, increasing speed as rapidly as possible up to 25 knots as soon as the signal "Extend to adopt method of attack No 2" is seen. At night they should act without waiting for a signal.

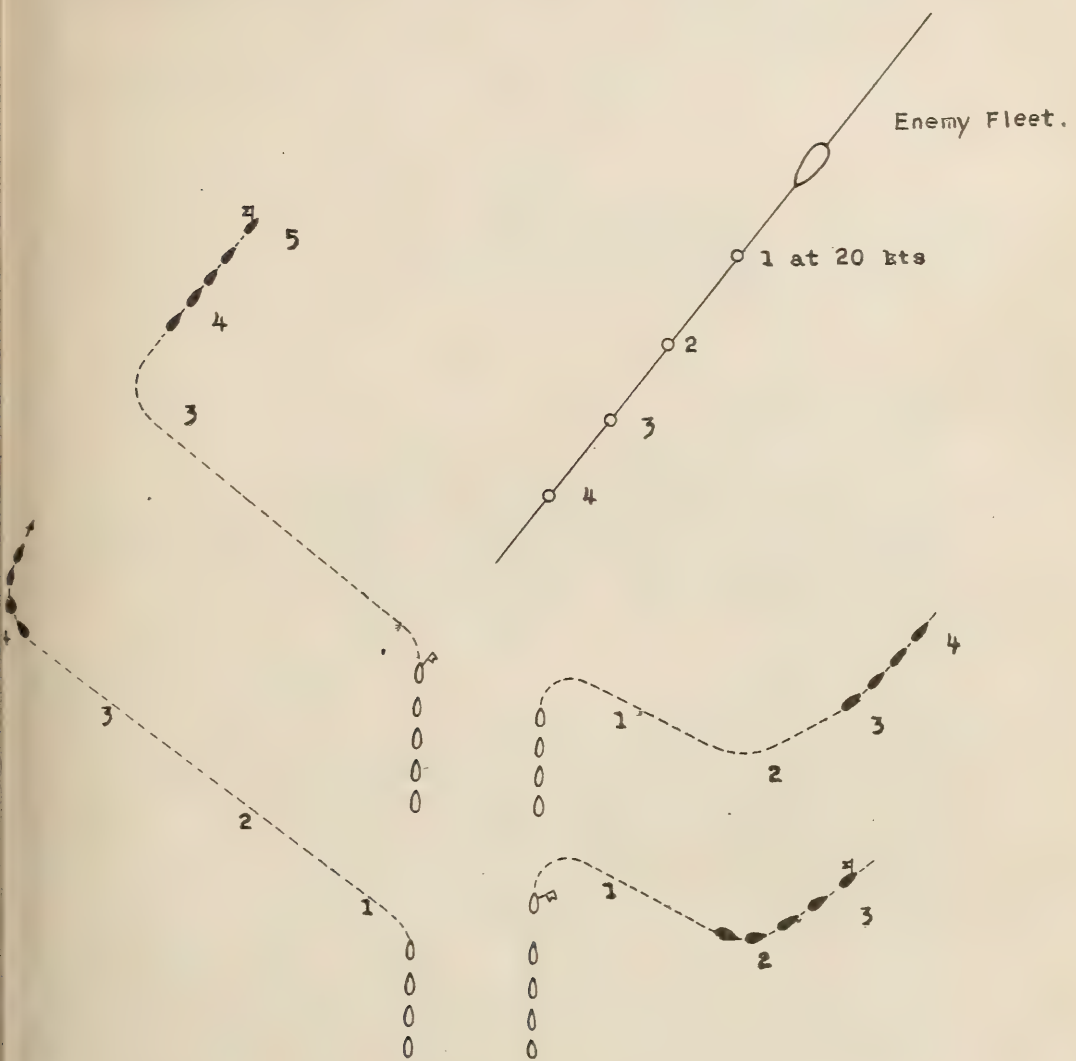
The diagram shows an attack in which the enemy does not alter course. The four divisions attack at a somewhat fine angle. This will make it more difficult for the enemy to bring effective gunfire to bear. It is highly improbable, however, that the enemy will con-

DIAGRAM NO. 6.

METHOD OF ATTACK No. 2.

(For use at night or in misty weather, when a flotilla may be confronted by a fleet or squadron ahead or nearly so.)

Diagram represents a night attack, the enemy's fleet having been sighted at 2 miles distance, to illustrate the necessity for prompt action.



PROCEDURE.

Signal to attack by method No. 2 is obeyed as soon as seen. Divisions turn, leading ships together, remainder in succession, outwards at right angles to the bearing of the enemy and increase to 25 knots.

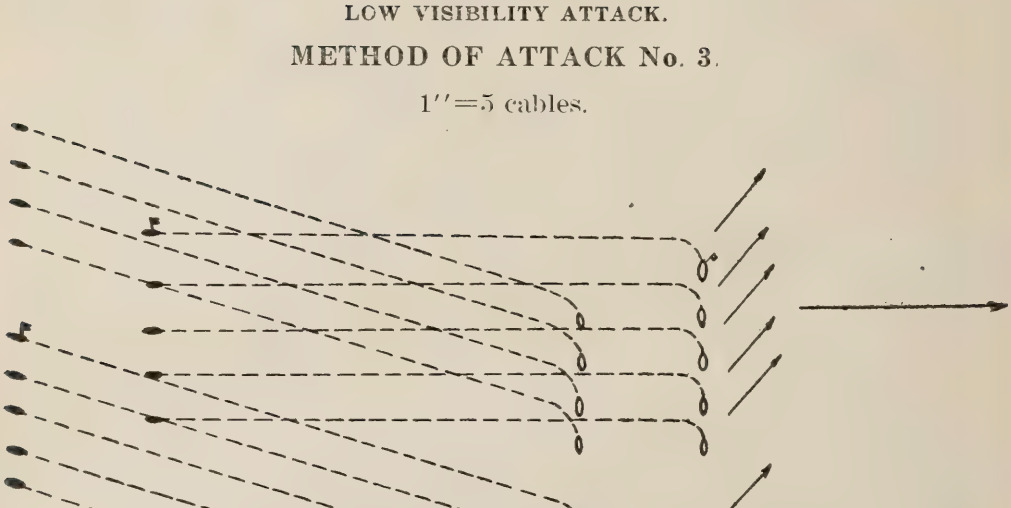
When a suitable position has been arrived at the leading ship of each division should lead round with 10° of helm and each ship will fire her torpedoes as the sights come on.

DIAGRAM NO. 7.

LOW VISIBILITY ATTACK.

METHOD OF ATTACK No. 3.

1″=5 cables.



tinue his original course, and, unless the fleet turns 16 points together, one half of the flotilla must get in an attack under favorable conditions.

Method of attack No. 3 is intended for use in misty weather, when the flotilla may be suddenly confronted by a fleet or squadron abeam, or nearly so, and within torpedo range.

The object is to deliver a torpedo attack *immediately* from the divisions which are in a position to do so; the whole flotilla then turning away out of sight of the enemy preparatory to delivering a second attack from a more advantageous position.

Torpedo Attacks on Enemy Heavy Ships.

The success of the initial attack must depend very largely on the torpedoes being fired so quickly that the enemy do not sight the flotilla and, consequently, do not turn off in sufficient time to avoid the torpedoes.

NOTE.—If the inclination of the enemy is 130° or more, the chances of success are reasonably good. If the inclination is less than 130°, the flotilla should obtain a more advantageous position before firing torpedoes.

The instructions in the following paragraphs are to be considered a guide to destroyer officers, but, as it is inadvisable to legislate for too many possibilities, they must generally use their own discretion.

Adjustment of Torpedoes.

(*a*) *In daylight, when working in conjunction with the fleet.*—All torpedoes are to be set to the medium-speed setting, 18 feet deep.

The "run-away patch" should *not* be in place, but the counter should be set to the maximum.

(*b*) *At night or in foggy weather.*—Two torpedoes are to be set to the high-speed setting, 18 feet deep, counter set to 5,000 yards, for use against heavy ships.

Any other torpedoes available are to be set to the medium-speed setting, 10 feet deep, counter set to 5,000 yards, for use against light cruisers or submarines on the surface.

NOTES.—(1) If the visibility of the night is so high that destroyers will probably be sighted outside 3,000 yards range, the two torpedoes adjusted to the high-speed setting may be set to the medium-speed setting at the discretion of the commanding officer. The range the torpedo will run must be adjusted to suit the visibility and the tactical situation by setting the counter so that there is no risk of torpedoes endangering friendly ships if they run beyond the enemy.

(2) If it is considered probable that only enemy destroyers will be met with, the depth setting should be altered to 8 feet and the torpedoes should be set to the "high-speed-cold" setting.

It must be clearly understood, however, that 8 feet is too shallow for use against heavy armored ships. If, therefore, in the presence of enemy heavy ships, torpedoes should be set to 18 feet and fired at these ships.

If the enemy battle cruisers, steaming at high speed and separated from the enemy battle fleet, are met with, a flotilla attack should be carried out with circumspection, and only if a position well ahead is attained. The chances of success are otherwise remote, owing to the ease with which torpedoes observed to be fired can be avoided.

If, as is more likely, the enemy battle fleet is in company with the battle cruisers, all flotillas carrying out a torpedo attack are to endeavor to develop an attack on the battle fleet. It is not the duty of flotillas under these circumstances to attack the battle cruisers; the battle fleet is *the* important objective.

The torpedo attack should be developed as early as possible consistent with the probability of success. This will depend on the position of the attacking flotilla and whether or not the enemy fleet is under effective gunfire. If well ahead, the flotilla may be able to attack soon after deployment, even though the enemy fleet is not being fully engaged by our battle fleet; if not so far ahead, it may be necessary for the flotilla to go into closer range to fire torpedoes, and this should not be attempted until the enemy is under gunfire from our main fleet.

Circumstances may also permit a flotilla to fire torpedoes from their position in the line without making an open attack (position "A^1," diagram 8), and hence without the enemy perceiving it, when he will be less likely to turn away or to keep a special lookout for the arrival of individual torpedoes.

If a surprise long-range attack is not possible, and the enemy is developing a rapid and effective gunfire, torpedoes should be fired from a position about 9,000 yards from the enemy line. If the ideal position can be reached, the enemy will have to turn away 45° or more to avoid the torpedoes; if a less advantageous position has to be accepted, the enemy will still have to turn away 22° to avoid them. By closing in to a shorter range, no advantage is gained which would compensate for the probability of the attack being frustated by gunfire.

Torpedo Attacks on Enemy Heavy Ships.

If, on the other hand, enemy gunfire is feeble, and no difficulty is anticipated in pressing in, it is advantageous to attain a position about 7,000 yards from the enemy line. Torpedoes fired from this position will cross the enemy track, even should the enemy turn away 45°, or more if the attack is made from well ahead.

Except when firing torpedoes at single disabled ships, little advantage is gained by going in beyond the 7,000 yards gun range.

Procedure for Attack.

Select as a target line a portion of the enemy battle line consisting, if possible, of eight ships.

Select as a point of aim the fourth ship, or, if the target line consists of less than seven ships, the center ship.

The ideal position to attain is 45° from right ahead 10,000 yards from the van enemy ship, the eight van ships being considered as the target line.

This is equivalent to taking up a position 3½ points from right ahead 11,000 yards from the target ship if it is preferred to form on the target ship rather than on the leading ship.

If it is impracticable to attain this position and to attack the van, then select any eight consecutive ships of the enemy line as the target line, their position being such that it is possible for the attacking flotilla to attain a position not more than six points from right ahead 10,000 yards from the leading ship of the target line.

This is equivalent to taking up a position 62° from right ahead 11,000 yards from the target ship if it is preferred to form on a target ship rather than on the leading ship.

This will keep the flotilla outside 9,000 yards gun range of enemy's ships ahead of the target line, but the enemy can avoid the torpedoes if he turns away more than two points.

Should the enemy gunfire be feeble the same procedure should be followed, but if the van position can not be attained, then select any eight consecutive ships of the enemy as a target line, their position being such that it is possible for the attacking flotilla to attain a position four points from right ahead 10,000 yards from the leading ship of the target line—30°, 11,000 yards, from the target ship.

This will bring the flotilla in to 7,000 yards gun range of enemy ships ahead of the target line.

Commanding officers of destroyers must use their discretion as to allowing for a turn away of the enemy on the torpedo sight. It will generally be desirable to allow for a probable turn away of 22° on the sight for a Browning attack unless it is seen that the enemy are turning or are likely to turn toward the attack. This will give a good chance of hitting, whether the enemy turns away 45°, 22°, or continues his original course.

Destroyers of a division attacking should use the estimated speed and course of the enemy, as signalled by the flotilla leader, on the sight, making an allowance for a turn away, as described above. The natural spread of the torpedoes will be sufficient for the purposes of a "browning" attack without varying the setting of the director for different destroyers of a division.

Remarks on the Above Procedure.

Destroyers which can reach the position "A" are in the ideal position, being at a gun range of 10,000 yards from the enemy battle line, whilst the normal to the enemy's line is only 7,000 yards. Position "A" at 15,000 yards is only suitable for a surprise attack from which the enemy is unlikely to turn away. Position " B " allows only for a turn of 22 degrees or less; moreover, the torpedoes are approaching from abaft the beam of the enemy on his original course and are therefore easier to avoid individually.

Destroyers which can not reach the position "A" will, if under heavy gunfire, endeavor to fire torpedoes from a position on the dotted line, keeping outside 9,000 yards gun range from the enemy.

Torpedo Attacks on Enemy Heavy Ships.

Diagram No. 8 shows an enemy line of 20 ships in single line ahead. Destroyers can attack this line from any position on the dotted line between "A" and " B." When at " B " the rear enemy ships, numbers 13 to 20, form the target line.

It will be seen that in attacking a line of 20 ships destroyers can not afford to get abaft number 6 ship of the enemy line; hence the importance of not falling down toward the center and rear of the enemy battle line when making the attack; it is essential to keep up toward the van.

Procedure After the Attack.

It is of great importance to regain our van if it can be done, especially if the attack is made in the early part of a fleet action, and all torpedoes have not been expended.

If, however, the attack has been delivered on the center or rear of the enemy line, it is improbable that destroyers could return to the van; an attempt to do so would lead to the destruction of the flotilla.

If destroyers come under a hot fire from the enemy's ships, the course to be steered after firing torpedoes is to be that which will take them out of range of the enemy in the shortest time, the turn being made the shortest way to the new course. In most cases the course will be at right angles to that of the enemy.

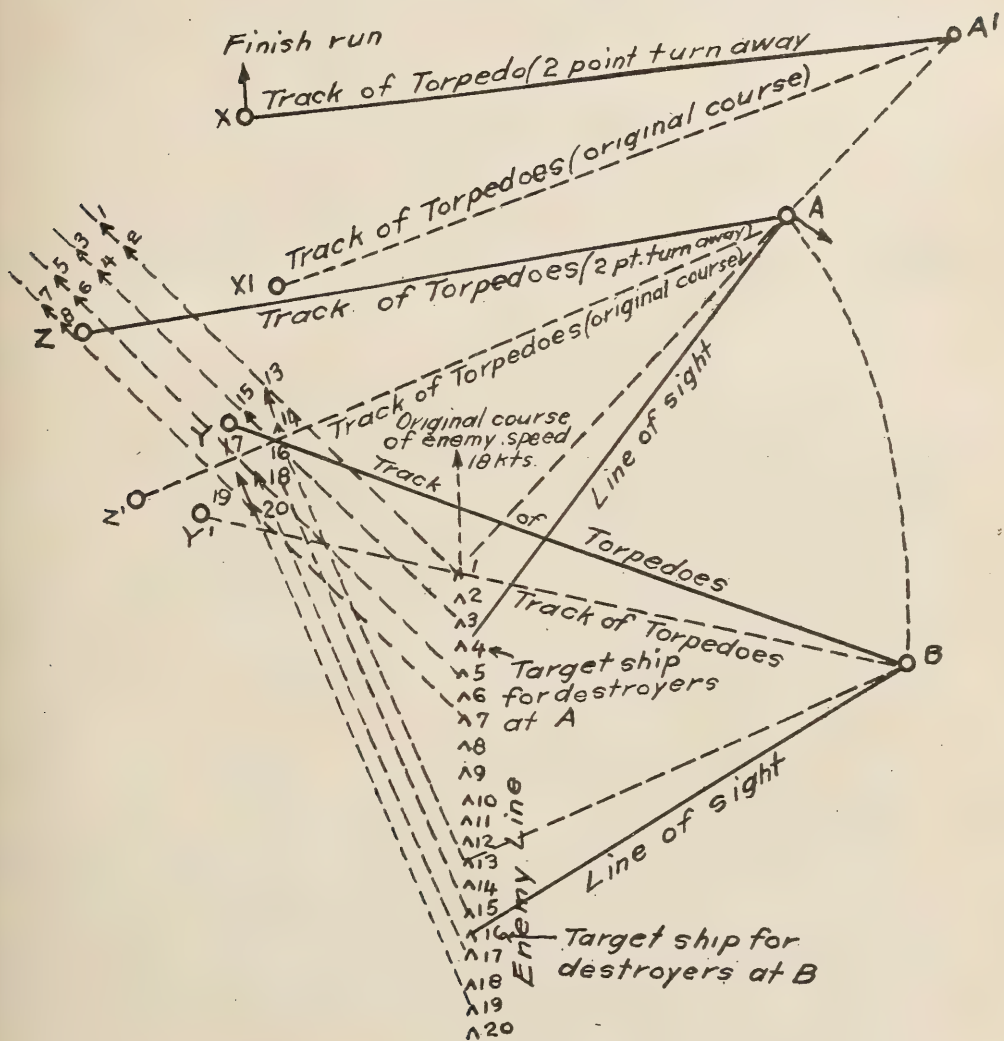
When clear of the enemy's fire and approaching our fleet, the divisional commander can decide whether it is possible to regain the van of our fleet or not.

Destroyers attacking from the advanced positions at the van of our fleets who find it impossible to regain their original position may, nevertheless, find it possible to regain one of the less advanced positions at the van.

Destroyers under fire should on no account turn in each other's wake, nor should they present a deep target to the enemy, such as a column in single line " end on."

DIAGRAM NO. 8.

METHOD OF ATTACK ON ENEMY HEAVY SHIPS.



In the later stages of a fleet action, when it is probable that the enemy secondary armaments have been crippled and the speeds of the fleets reduced, it may be possible for the destroyers to return to the van, even from an unfavorable position; this will depend on the accuracy and volume of the enemy's gunfire.

Course for the Attack.

The course for the attack must be determined by the leader, half leader, or divisional leader, either from the Battenburg course indicator, the attack disk, or by means of tables showing for given ranges and given positions relative to the enemy the course to steer to attain the required firing position.

The unaided eye is usually insufficient to determine the initial attack course; the attack disk or tables should be used, and any small alterations necessary later can be estimated by eye.

Particular attention is necessary not to lead in at too steep an angle. Ground is thus lost and the flotilla is forced to accept a less advantageous position.

Method of Attack No. 1.

The attack is developed by one division, called the directing division, steering the "Attack course" as found by Battenburg Course Indicator or attack disk, the remaining divisions steering divergent courses until they are sufficiently far apart and then turning to the attack course signaled, so that all divisions are eventually steering parallel courses. The attack can be carried out equally well with the flotilla in cruising orders 1, 2, or 3, and is suitable for all visibilities other than low.

The Directing Division.

In flotilla cruising order No. 1. The directing division is the leading division on the side on which the enemy is sighted.

In flotilla cruising order Nos. 2 or 3. If four divisions are present, the directing division is the third division, counting from the flank on which the enemy is sighted. If three divisions are present, the directing division is the center division.

Torpedo Attacks on Enemy Heavy Ships.

Examples: Enemy sighted on starboard side, flotilla in cruising order No. 1. Division B is the directing division.

Enemy sighted on port side, flotilla in cruising order No. 2. Division B is the directing division.

NOTE.—The letters refer to the positions in flotilla cruising orders and flotilla night cruising orders (latter not included).

Station of Leader and Half-Leader.

When the attack is developed from cruising order No. 1: Before it is necessary for the attack signal to be hoisted, the leader should place himself ahead of the directing division, but the half-leader should remain in his cruising station to facilitate signaling until the attack commences, when he should place himself ahead of the rear division on the side away from the enemy.

When the attack is developed from cruising order No. 2: The leader places himself ahead of division A and the half-leader ahead of division B.

When the attack is developed from cruising order No. 3: The leader places himself ahead of division B and the half-leader ahead of division C.

General Procedure.

The divisions should open out to about 1 mile apart to allow ample room for divisions turning to fire their torpedoes or to meet a counter attack. At the same time, this disposition presents a difficult target for the enemy to engage by gunfire.

Speaking generally:

(*a*) When the enemy is in such a position that the attacking flotilla will have to run a distance of 7,000 yards or more (8 minutes at 25 knots) to reach the firing position, the amount of divergence should be two points.

(*b*) As the distance run to reach the firing position decreases, the amount of divergence must be increased to allow divisions to spread rapidly.

NOTE.—Not more than four points divergence should be required.

Detailed Procedure.

The leader hoists the signal "Intend to adopt method of attack No. 1." A compass signal immediately inferior will indicate the attack course; a numeral signal inferior will denote the number of points divergence.

When the signal is hauled down all destroyers increase speed to 25 knots (unless another speed is signaled), and the divisions alter course as follows:

NOTE.—Leading ships of divisions *at once* turn to the new course and do *not* follow in the wake of the leader or half leader. The latter should regain station ahead after the turn.

(A) *Attack developed from cruising order No. 1.*—The directing division alters course to the attack course. The leading division on the side away from the enemy alters course to the attack course less the number of points of divergence. The rear division on the side away

from the enemy alters course to the attack course plus the number of points of divergence. The remaining division alters course to the attack course plus twice the number of points of divergence.

(B) *Attack developed from cruising orders No. 2 or 3.*—The directing division alters course to the attack course. The division farthest away from the enemy alters course to the attack course less the number of points of divergence. The division next to the directing division on the side nearest the enemy alters course to the attack course plus the number of points of divergence. The remaining division alters course to the attack course plus twice the number of points of divergence.

As soon as each divisional commander considers that he is sufficiently clear of the other divisions (leading ships about one mile apart) he should turn to the attack course and his destroyers should then gradually haul out on the quarter nearest the enemy and form on a line of bearing from the divisional commander approximately at right angles to the bearing of the enemy.

On arrival near the firing position the divisional commander should turn to within one point of that course, which will enable torpedoes to be fired, the division following motions, and thus coming nearly into line ahead.

Torpedo Attacks on Enemy Heavy Ships.

On arrival in the position from which to fire torpedoes, the division should be turned together away from the enemy.

The small alteration of course thus required to bring the sights on should not cause the ship to heel unduly. (This point is important, as a large amount of heel would affect the torpedo's depth taking.)

NOTES.—The times shown in the diagrams are approximate. The bearings refer to the leading ship of the enemy line.

The movements of flotillas must be regulated so as not to hamper the heavy ships.

The captain (D) will indicate the range of the leading ships of the target line at intervals of 1,000 yards.

Signal "My rangefinder range in hundreds of yards is as indicated by numeral flags inferios," may be used for this purpose. It is to be hauled down on reaching the range indicated. Captain (D) will also indicate estimated course and speed of enemy by W/T.

To avoid the possibility of torpedo tubes being trained on the wrong side, owing to an uncertainty on the part of commanding officers as to their leader's intentions, commanders of divisions are to indicate as early as possible when proceeding to the attack the side on which torpedo tubes are to be trained.

The signal "Open fire with torpedoes" is to be made by commanders of divisions as an indication to their divisions that torpedoes are to be fired when the sights come on; if, however, this signal is not made, commanding officers are not to hesitate to fire their torpedoes when in a position to do so.

Method of Attack No. 3.

Signal "Intend to adopt method of attack No. 3" to be obeyed as soon as seen.

General Procedure.

The division nearest the enemy in each half flotilla is considered as the *striking force*, and the success of the attack will very largely depend upon the ability of this striking force to fire torpedoes before the enemy sights the flotilla.

NOTE.—When setting the torpedo-control disk, allowance should be made for an alteration of course by the enemy of two points "away."

Detailed Procedure.

On the above signal being hoisted, the divisional commanders of the striking force turn their divisions together (either by hoisting the blue pennant singly or by the ordinary blue pennant method), and torpedoes are fired as the sights come on. The striking force increases to 25 knots when the turn is commenced, unless any other speed is signaled. The remainder of the flotilla under the orders of their divisional commanders are to keep clear of the striking force by also turning away together, increasing to 25 knots (unless any other speed is signaled) as they turn; being careful not to lose touch so that the whole flotilla may reform on the captain (D) as soon as possible.

All divisions must turn to a course which will take them out of sight of the enemy as quickly as possible.

The captain (D) will then lead his flotilla to a favorable position from which to make a second attack.

NOTE.—As the attack is of the nature of a surprise, the disadvantage of firing torpedoes with the ship under helm must be accepted.

Comment.

If it is desired to fire a torpedo along a prescribed course it is true, not firing "under helm" is disadvantageous, but for a "spread" this disadvantage is nullified.

INTERNATIONAL.

PRESENT CONDITIONS IN SOVIET RUSSIA.

Source: Reliable.

31 March, 1920.

The following is a report made to the British War Office:

One hesitates to commit to paper any opinion regarding the state of affairs in Russia, the question is so complex and the information so divergent that to arrive at a correct appreciation of the situation is no easy matter.

In general only two sources of information exist, firstly Soviet representatives, or visitors of distinctly Bolshevik views, and secondly Russians and prisoners of other nationalities of very strong conservative or reactionary tendencies.

From the very start, therefore, it is almost impossible to get a true picture of the conditions in Russia to-day. As a small example, the following incident might be mentioned. Mr. L. wires that in Moscow all trains are met by a service of droshkies, while an ex-Russian officer, a refugee from Moscow, states that horses have nothing to eat and die where they stand in the streets and are eaten by the mongrels that wander about the town in search of food.

However, there do exist a few observers to whose reports a certain credence may be attached. In particular certain Lettish officials who have recently returned from Moscow, where they were employed on a Red Cross delegation. Another class of people from whom information may be obtained is the Soviet representatives now in Reval, who when not in the public eye are occasionally prepared to discuss openly and frankly their views as to the future of Russia.

Furthermore, as a result of peace between Esthonia and Russia, a certain amount of private correspondence is passing through to these countries and in these letters glimpses of the truth are sometimes revealed.

The report is submitted under two main headings, "The attitudes, activities, and conditions of the various classes of Russian people," and, secondly, "The general material conditions of the country." The subject is so vast, and the means of gaining information so slow and uncertain, that such a report is naturally very incomplete.

Headings of Report.

1. The various classes of people in Russia may, for the purpose of this report, be divided as follows:
   (*a*) Soviet leaders.
   (*b*) Workmen.
   (*c*) The army and navy.
   (*d*) Peasants.
   (*e*) Intelligentsia and Bourgeois.
   (*f*) A small class drawn from various social grades, still actively opposed to Bolshevik Communist principles.
2. The conditions in Russia are referred to under the following headings:
   (*a*) Conditions of life in town and country.
   (*b*) Commercial.
   (*c*) Political.
   (*d*) Communications.
   (*e*) Agricultural.
   (*f*) Industrial.
   (*g*) Financial.
3. The following subjects are not dealt with in this report: Education, art, religion.
4. A few short notes on propaganda are also attached.

Soviet Leaders.

Soviet leaders are beginning to realize and even admit that they do not represent the Russian people as a whole, and amongst those at Reval there were some who, with an air of pathos, complained bitterly that the name of "Soviet" was nauseating to all civilized people. Furthermore, they realize now that there is no great hope of successful Bolshevik propaganda pursuing its advance westward. It is considered by some that even their constant efforts at organizing risings amongst eastern peoples, originally the outcome of ideals of world revolution, is now only continued in a spirit of revenge on the great powers, particularly England, who have refused to defile themselves by intercourse with the Soviet; and many of the present leaders of the Soviet feel they must confine their energies primarily to setting their own house in order, and thereby justify their views which have been expressed and spread throughout the world with such energy regarding the happy and well-organized state they promised to create.

As evidence of the gradual change of mind denoted above, one may cite their obvious desire to get into close contact with the western capitalist States for purposes of reopening commercial relations; also the attitude of the Reval delegates, whose one object now seems

to be to obtain locomotives for means of transport and to obtain advice and assistance of capable organizers from the western world to regenerate their country.

Memorandums circulated among the higher Soviet authorities recently, show a far more pessimistic outlook, showing that it is realized that the time for high-sounding phrases is now over and that all must seriously consider the definite physical problems of the future.

The position of the industrial workers in Russia is somewhat difficult to appreciate. They were among the prime movers of the original revolutionary movement, and the extreme length to which their counsels have led Russia should have satisfied their wishes, but, as in all parts of the world, they are likely to remain the most discontented section of society. The highly educated workman has in many cases taken up the more lucrative profession of commissar, others have found conditons in the army more satisfactory. This will result for some years in the paralization of industry, unless the very strongest and most autocratic measures are taken by Soviet leaders with regard to these workmen. This in a way will be a reversion to the very principles which Bolshevism set to destroy, and will form another chapter in the general education of Bolshevik leaders in the principles of government. Labor risings are not unlikely, but it is extremely doubtful if any benefit to themselves or to the country can possibly accrue.

The workmen receive large salaries, anything from 20,000 to 25,000 rubles a month, and in many cases are paid whether they are working or not. It is reported that a compulsory 12-hour working day has been established.

In spite of the high wages, a certain number of workmen are now leaving the towns in hopes of being able to support themselves in greater comfort on the land.

The Labor Party as an organization has ceased to exist in Soviet Russia. Several attempts on the part of the workmen to establish their rights have been mercilessly met by force, and since the militarization of industries they have no voice in the matter.

All attempts to man factories, workshops, etc., on communistic lines have failed.

The workmen have lost all interest in politics, and for their benefit the Bolsheviks organize compulsory meetings and lectures at which resolutions are passed without debate or voting.

It will be seen that Bolshevism, far from producing the Elysium for workers and far from being the panacea for all the evils of capitalism, has brought discontent and misery upon all classes of laborers, industrial and agricultural.

The leaders are finding that until the spirit of responsibility of duty to State and neighbor and of social discipline is born, the most autocratic measures will always be necessary for the handling of large masses of uneducated men and for the efficient administration of the vital services of a State. As a consequence labor in Russia is to-day suffering from an oppression more severe than before and far more severe than exists in the so-called capitalistic countries, where they are supposed to be slaves.

Russian labor has long hours, no redress for grievances, little or no political voice, and lives under the worst physical conditions.

The Army.

The outward results of the past months are that the Red Army has thoroughly defeated all White Forces, in spite of every possible assistance, financial and material, given by the leading powers. Full use is made of this with very considerable effects upon the ex-Russian officers who are now joining the Red Army, and also upon the Red soldiers. The number of Russian officers who are now joining the Red Army increases daily, and includes many well-known men, with the result that all the higher commands are entrusted to them. It is believed also that these officers are quietly acquiring a great influence in the army, and as few of them are really Bolshevik by conviction, their presence and influence may become a great stabilizing factor in the future.

Soldier councils have ceased to exist. Again, an iron discipline prevails, and lastly, the soldier, to the exclusion of all other classes, has been clothed and fed, and is even in a position to send food to his family to supplement the smaller rations given to noncombatants.

The general result of this is that the army can be considered as a strong and fairly well organized force. The universal experience, however, of allied officers employed either in north Russia or the Baltic Provinces, is that, with all these advantages, the value of the Bolshevist troops as a military weapon is contemptible. So long as the troops oppressing them are not thoroughly impregnated with propaganda, the Bolshevik troops, however great their numerical and artillery superiority, have seldom shown any great ability or desire to push home an attack. This was particularly the case in the recent operation on the Esthonian front, where the Bolo attacked the Esthonians with a superiority of about 6 to 1, and supported by superior artillery, and yet the attacks were never a source of even anxiety to the Esthonian command. In the defense, equally, the Bolshevik troops are not able to withstand any serious attack. On the first signs of a successful attack the whole front crumples and large numbers willingly surrender. Of course, certain communist

detachments fight bravely and well, but they are a small percentage of the whole army.

The military situation to-day is such that there is no white army which constitutes a menace to the soviet régime, nor have either the Baltic Provinces or Poland any further aggressive designs on Russia. Soviet land has therefore no immediate need for large forces for defensive purposes. Further, though she has probably intentions of carrying on an offensive against Poland, or the remnants of Denikin's force, the numbers that may be maintained on these fronts are limited, and thus she is now in a position of having an army far greater than the military situation demands. At the same time she is not entirely confident that a new situation will not arise when her present forces may be required, and her authorities are also thoroughly aware what a great disturbing factor the demobilization of large numbers of men will be on the country at large under existing conditions, when employment is nil and only soldiers are properly fed; indeed, such a measure would probably result in the overthrow of the Government, and the downfall of the soviet power. These conditions have brought about the formation of labor armies, the existence of which have already been reported. The entire military organization has been maintained and the labor armies could at once be reorganized into field armies. The crying needs for improved means of transportation will for a time give ample occupation for these armies, and the work on which they are employed is of such a nature that numbers and military organization and discipline will produce good results. Woodcutting for fuel, clearing snow on railway tracks, improving roads and railway tracks, are all work of this nature. Subsequently, however, when such work is completed it is difficult to see how such an organization will compete with agricultural and workshop demands, and it will probably be a hopeless failure. Nevertheless, it is believed that the labor armies will be maintained until such time as the economic reconstruction of the country has reached such a stage as to permit the demobilization to be carried out without undue danger. This period will depend entirely how quickly the opening of trade will effect improvements in the means of transportation, which is the first necessity before the country can possibly settle down. But until the labor armies are demobilized their existence must always be regarded as a large military reserve which can be transferred into a military weapon at very short notice. Army rations consist of $1\frac{1}{2}$ pounds of bread daily, 4 pounds of oatmeal daily, and very little meat—all horse flesh.

The Navy.

The Bolshevik fleet.—"Neue Preussische Zeitung" reports that Soviet Russia has a strong fleet. They have five large battleships, amongst which are ships of the *Gangut* type. Besides these they have also the *Andrei Pervosvanny*, *Respublika*, the cruisers *Riurik*, *Bogatyr*, and *Svetlana* (new). Cruisers *Diana*, *Admiral Makarov*, *Baian*, and *Avrora* have been for some time at the Petrograd shipyards. Of large destroyers they have but six, one of them being called *Garibaldi*. A number of hydroplanes are kept at Granienbaum.

The fleet suffers from lack of coal, but if the supply improves the Bolshevik fleet will have to be taken into consideration.

There are as yet no reports to hand referring specially to the discipline and state of morale amongst naval ratings, but it may be presumed with a certain amount of certainty that, owing to the proximity of the fleet to Petrograd, which has always been a center of extreme forms of revolutionary propaganda, and to their enforced idleness, it is probably inferior even to that of the army.

Naval headquarters are reported as having moved recently from Petrograd to Moscow. This is not the first sign of a possible transfer of the capital from Petrograd.

Peasants.—"The dark people," as ever, remain the body and the heart of Russia, and the foreign elements who during the past two years have controlled the destinies of this country have not fully realized this. The peasant and the land worker will probably always be indifferent to policies and propaganda emanating from those in high places. He is concerned with his house, his cow, and his small bit of land.

In south Russia his choice between Denikin and Lenin was made on the one question of land only. Lenin promised him land, while he feared that Denikin would take it away.

When the principles of communism were first being put into force and the land was equally divided among all classes of peasants the result so often overlooked by idealistic reformers occurred, that the more industrious worker was penalized at the expense of the lazy and illiterate, and, further, in the early days, when equality for all men was the cry, any peasant who, through energy and initiative, amassed greater wealth than his neighbor was likely to be persecuted. Since those days, however, the soviet authorities have learned a little wisdom, and their present policy is rather more to encourage the slightly better class and more hard-working type of peasant, while the lazy and incompetent laborer continues to be employed as a laborer, rather than as a private owner of land.

The peasants are now in a very strong position. They have a certain amount of land and, above all, a sufficiency of eatables, and

refuse to part with land produce for Bolshvik money. Exchanges are effected with towns for industrial products and salt.

It is not considered probable that there will be any peasant rising on a large scale. In the first place, there is no organization existing for such a movement, and, in the second place, it apparently seems to be realized that, bad as things are, they are better than they used to be, and, furthermore, they feel that the Soviet is unlikely to employ any coercive measures with regard to the supply of food, etc., from the country areas, owing to the storm of opposition that would be roused. It is considered that 86 per cent of the land has been divided up amongst small peasants, and that only 2 per cent of the land now remains under communist tenure. Officially and legally, the land is supposed to be on lease to these peasants, but the latter regard it as their own property.

The need for agricultural implements is enormous, and the factories are quite unable to cope with the demands.

Intelligentsia and bourgeois.—This type represents an interesting psychological study. At no time in the past history of Russia have these people ever been gifted with any great energy or initiative. They are dreamers, philosophers, and idealists, cultured in the arts, and with ready tongues. To be a student is a sufficient rôle in life for many Russians. At the same time, these people do represent much that is best and admired in Russian life. At present suffering and hunger have reduced these people almost to a state of coma, in which they can neither move nor think nor act. They exist, and like some elementary organism, search vainly for food and warmth.

They are unable to work, and live by selling their clothes, furniture, and jewels. As is known, cases occur of professors and women of society earning a few roubles by cleaning the streets.

The more intelligent leaders of the soviet, realizing that cultured and scientific knowledge is necessary for the life of any state, endeavored to establish newspapers and schools for the furtherance of these objects.

It appears as if there was a gradual relenting of the remorseless attitude toward this type, and unless this comes to pass the future of Russia will probably be greatly handicapped by the absence of these qualities.

There is no question, nor ever has been, of expecting any organized rebellion from this class, which includes most of what we call professional services, i. e., doctors, teachers, and the enormous number of people who work in offices, either Government or private.

It is a fact that the bulk of the remaining intelligentsia is now employed by the Soviet Government, as this is their only means of existence. In general, disappointed by the failures of the last year, they are antiallied in views.

Even were circumstances favorable for combined action, they are nearly certain to disagree amongst themselves.

The small trader and commercial man is most always a Jew, and he has only two interests in life—money and Jews—and is not likely to produce any anti-Bolshevik energy, as the present régime is one that he has found extremely suitable. It gives him every opportunity for bribery and corruption, and he has taken full advantage of the situation to acquire the stolen valuables of the upper Russian classes, and which, however great the difficulties, he has not failed to transport to Scandinavia and sell at vast profit. He has, in fact, every inducement to support any party which promises the continuance of unrest in eastern Europe. This is apart from the international Jew, who is considered by many people as responsible for the course of events during the last few years in Russia, and whose ideals in life are power rather than small commercial activities.

A précis of a letter from a representative of the professional class is attached.

Some of the middle classes are said to be buying up land secretly and preparing the fall of the present régime.

Letter from professor at Petrograd (*Precis*).—Petrograd has become a city of the dead. Worse than that, it has been compared to a lunatic asylum, with the inmates chattering at each other and striving to amuse the visitors who come to look at them from time to time. That is the impression the educated classes have of themselves and each other.

Everyone's energy and intelligence is directed to the one ideal of not starving on a given day. All foresight for the next day has long perished, and the vital necessaries of the morrow are sold recklessly to mitigate the horrors of to-day.

All shops and works are closed. Their former inmates have now realized the ideal of being officials. As such they walk aimlessly through the town for a miserable salary and are satisfied with themselves until, failing to buy anything from the peasantry, they curse the latter for the misery they themselves have brought about.

Sanitation in any form has broken down, and the thaw is not far off. Homes are unheated. There is no light.

This is the condition in which the intellectual class of Petrograd has chosen to stay rather than sever their connection with the country they love. Because they feel that they are the last link between the old culture and art of Russia and the barbarian state that bolshevism has put up in its place

They do not reproach those who left Russia. They may be more useful to the cause abroad—provided they were not guardians of a certain trust. But they claim to be remembered with the respect due

to the sacrifice they have made and not to be accused of staying on for the personal benefit that the existing régime gives.

How can Kolchak, Denikin, and Yudenich conquer the country, when the way lies across the country's own blood? War only increases the hold of the Bolsheviks over the country. Create a new government, with an ideal and tradition to look up to—if necessary, with a Tsar—and then there will be no more need of the sword.

They ask that the old people and the children may be saved out of the wreck of Petrograd, that there may be no slacking in the cause—not of revenge or conquest, but of saving the remnants of a drowning nation.

Menshevik.—Mensheviks, while strongly opposed to bolshevism, are by no means in favor of Denikin, Kolchak, and others.

Their power is extremely limited, as they are not permitted to hold meetings, and, as we have now learned, the power of the spoken word among all classes of Russia is limited. They only have one newspaper, and are not represented in the Government, nor, it appears, do they wish for this representation.

Their views appear to be moderate, and if from this class can arise that rare individual, the intelligent Russian endowed with energy as well, they may in the future play a considerable rôle in the reorganization. Their industrial policy is to nationalize all resources, but to leave the management of all industries to private initiative.

Alexinsky, a Social Democrat leader, who is convinced of the errors of extreme socialism, who was in Riga with Gen. Yudenich, stated that a special conference would take place of all anti-Bolshevik parties in south Russia, representing, in general, a party which is calling itself "The National Center."

He also spoke of the formation of a special peasant movement under Makhno.

During their short stay in Riga Gens. Yudenich, Vladimirov, Glasenap, and Alexinsky expressed in private and through the medium of the press, their views on the general anti-Bolshevik question. These views do not appear to have undertaken any great change as a result of the last year's happenings. They still continue to speak with a certain amount of confidence of future action against the Bolshevik forces.

All good men are definitely against Bolshevism. But for the present they feel that any change would make the destruction of Russia more complete, as it would be subversive to order, which has now been established.

Conditions in town and country.—Conditions in town, according to all sources of information, appear to be deplorable. Conditions

of all streets and houses are indescribably filthy, sanitation has almost ceased to exist.

Hospitals are little better than death traps.

Public restaurants are now organized, but the food that can be obtained there is insufficient in quantity and revolting in taste. None of the ordinary amenities of civilized life exist, except for such officials as have been able, through the illegal amassing of large quantities of money, to obtain a certain amount of comfort.

At the same time, an intelligent and unprejudiced observer recently reports from Moscow that very good order is maintained, and that robbery and violence are no longer committed as they were in the first days.

Petrograd.—The following table of averages on the Petrograd market, first in September, then in December, 1919, illustrates the rise in prices in three months for absolute necessities:

	1919	
	September.	December.
	Rubles.	*Rubles.*
Bread, 1 pound	70– 80	240
Rye flour	80– 90	290
Millet	100–120	300
Barley	125	400
Potatoes	18– 20	90
Carrots, Turnips, Beets	15– 20	90
Meat, beef	160–170	450
Pork	.....	800
Vegetable oil	320–360	1,700
Butter	360–380	2,100
Eggs (10)	190–200	1,000
Herring, one-half	65	200
Matches, 1 box	10	70
Wood, cubic fathom	900	10,000

Conditions of education and religion.—There is evidence to show that religion has not lost its grip on the masses and that the churches in many parts of Russia, especially in Moscow, have been well filled.

Education is practically at a standstill, and though children's schools do exist, the conditions of education are deplorable. No moral education is given, no discipline exists; boys and girls are educated together, and it is reported that the open immorality among the elder children is revolting to a degree, disease and childbirth being rife.

Commercial.—The eyes of all the world are centered on Russia, in its commercial aspect. Central Europe is starving and industries throughout the world are calling for raw material. The great

problem before all countries now is to what extent these hopes are likely to be realized.

This problem again resolves itself into one of transportation. Without a solution of this absolutely crying problem, there can be no question either of fulfilling the needs of the Russian people or of exporting material surplus to their requirements. Owing to this and to the lack of agricultural implements and the general idleness and lack of productivity during the past years, a considerable period must certainly elapse before large quantities of corn will be available for export. The available stocks of coal and much timber are likely to be required for rebuilding of mines, factories, etc. One can anticipate, however, that a certain amount of flax and timber will be available for foreign trade, but in general the needs of the country itself are so great that it is doubtful if the ordinary raw materials will be available in any large quantities for some months or years to come.

With regard to the opening of trade with the cooperative societies, it is observed that the chief Russian representative has been recently negotiating with the supreme council on this question, but reports from Russia, including the final announcements of recognized leaders, show that the cooperatives have been nationalized, have no politic representation, and can have no independent control in the distribution of foodstuffs. It must by now be clear to the authorities at home that the theory of direct trade with cooperative societies is impossible; in fact, in this part of the world, the public announcement of this policy is regarded as nothing more than a political bluff.

In an interview with Birkenheim, the chief of the Russian Cooperative Society, Litvinov is reported now to have declared that foreign imported goods can only be paid for in gold, and that the resources of the country do not permit of the export of raw material, and furthermore, that he was empowered to deal with all questions relative to cooperative societies.

On the other hand, the following report of an interview with Gukovsky at Reval shows that possibly a quantity of flax and timber will be available for export:

"The 'Waba Maa' representative had an interview with the representative of the Soviet Government, Gukovsky. He stated he intends to remain in Reval for a long time. He has great hopes in Britain and the United States, and intends to get into touch with merchants of these countries. In exchange for foreign goods Russia will supply flax and timber. The Don coal mines, although they are in the hands of the Bolsheviks, can not supply them with sufficient quantities of coal owing to the state of transport.

"Reference the rumors that Soviet Russia will maintain trade with cooperative only, Gukovsky denies this, stating that the Soviet Gov-

ernment is willing to get into touch with everyone who has got anything to sell. Trade in Russia is in the hands of the cooperatives, but the central committee, Moscow, controls all their actions.

"It appears that they now commence to respect foreign capital, and property formerly held by outside capitalists may yet be found intact when Russia is again opened up.

"The timber trade is at a standstill owing to lack of transport and consequent blockage of sawmills and timber centers. Moreover, the earlier reserve supply is exhausted, and the new supply is too wet to be of service either for burning or building.

"I have been informed by the American commissioner that Esthonia is endeavoring with the gold recently given by Soviet Russia to effect a large contract for locomotives and agricultural machinery in America. As Esthonia has no need for locomotives herself, it is probable that the whole order is intended for Soviet Russia, and this is the opinion of the Mr. Gade, and it is probable that Esthonia will hand over the purchases at a large profit to Soviet Russia."

Foreign policy.—It appears tolerably clear that the Soviet Government has abandoned, at least for the time being, and, so far as the western States of Europe are concerned, its policy of world revolution. This has been forced on to them by the necessity for the cooperation of the western States to prevent the economic chaos from destroying the country beyond all redemption, she earnestly requires peace with her neighbors and the rest of Europe. It is hard to believe that such a change is not pure opportunities, and that if conditions improve in Russia, and the assistance of the western States no longer vitally necessary, the final aims of the Bolshevik will once more be pursued with the greatest vigor.

A vigorous campaign is being carried out toward Asia, where the Bolsheviks are not above utilizing the national spirit to further the cause of world revolution. In India, Afghanistan, China, Japan, Persia, Egypt, and Turkey they are apparently sparing no effort to create trouble for the western powers. Enver Pasha is evidently in close alliance with Moscow.

The cessation of all propaganda, East and West, should be made an essential part of any agreement with the Soviet Government.

As regards their policy toward the Greater Powers, Soviet Russia as a political community has been in existence too short a time for the leaders to formulate any definite policy. Such a policy is bound at present to be based only on opportunism and will favor that group of powers from whom they think they can get the best return, and therefore any reliance on the Soviet Government to carry out its undertaking under the present régime would be most unwise. There

is little doubt that at present Germany is the most influential foreign power inside Russia, and that regular relations have for some time past existed between the two Governments. Germany, with the loss of her colonies, sees in Russia the only country from which to procure raw material, and the best direction in which to exploit her commercial aims, and she will not spare any effort to gain a predominant place in the future commercial life of Russia. Apart from the commercial ambitions the advantages of a military alliance between the two is obvious to all, and affords Germany her only way to regain her military position in the future. Thus it is certain that Germany will try to the utmost of her power to gain a predominant place in Russia. It may be she thinks her best way of doing so is to ally herself with the anti-Bolshevik forces, hoping with her help these forces may finally overcome the Soviet Government, but whatever her policy is to be it is certain to be ruthlessly prosecuted and with no regard to principle and directed exclusively in the interests of Germany and Germany alone.

Border States.—Except in the case of Esthonia resulting from peace negotiations there has been as yet no clear expression of policy with regard to the border States, but from the various reports available it appears that the present leaders are prepared to recognize the independent existence of the border States and the Ukraine. In fact, the principle of self-determination seems one acceptable to the Soviet Government.

Intervention.—The present existence of order under soviet rule must be carefully considered. Any active intervention which succeeded in overthrowing the Bolshevik régime would again throw the country into a state of chaos as far as the safety of persons and property are concerned.

The problem of Russia has therefore two solutions: Are we to countenance the present state of affairs and trust that the organization will gradually improve and that civilization and order will arise out of the dying embers of the Red revolution, or are we to relight the fire of battle and build anew when bloodshed has ceased again?

The allied powers are unprepared to support further military operations, and all points to the soviet concluding an armistice or peace with all its neighbors. We are therefore thrown on the first solution, but if a stable Russia is desired, and undoubtedly it is essential to the future peace of Europe, this task must be tackled by all with the greatest energy, enthusiasm, and sympathy.

But guarantees and reforms of all kinds must be demanded, the cessation of propaganda, and the abolition of the death sentence, the introduction of secret voting, a full pardon to all who fought for the White army, and permission to return to Russia, and other simi-

lar conditions. These conditions in return for full recognition by the powers would probably be acceded to; whether they would be carried out is another matter.

A few miscellaneous notes on general relations with foreign people are attached.

British.—It is reported that the English are the most hated foreigners in Russia, and also the most persecuted. This has been changing recently owing to the change in British policy. Only four English are at liberty in Moscow, the remainder are in concentration camps, and very badly treated. Mr. North, the British chaplain in Moscow, has formed a committee for the relief of the British prisoners.

German.—(1) There is a German Soviet in Moscow, the president of which is Rothnegel, who was arrested in Kovno on his way to liberate Radek. He is now again in Russia, the Germans having obtained his release.

(2) It is reported that a number of German officers have been arrested in Helsingfors on their way to Russia. Included amongst these are supposed to be several of those demanded for trial by the allied powers.

(3) An account of the very considerable liaison by aeroplane between Germany and Soviet Russia has already been forwarded to you on the 4th of March.

French.—There are several French Communists in Moscow; the chief amongst them are Petit, Pascal, Chapoigne, and Goilbeau, and the most of them are violently anti-British.

General.—There is also an Austrian Soviet.

There are also several Chinese and Lettish regiments in Russia.

There are many ex-German prisoners in the Red Army.

In Germany, Lenin's proclamation claiming Constantinople has been widely circulated.

The Moscow press reports that the Russian Soviet has now been recognized by the Social and Democrat Party of Czechoslovakia.

It is reported from Vladivostok that in the peace treaty between the Czechs and Bolsheviks there is a clause concerning the establishment of a neutral zone between the Czech rear guards and the Bolshevik advance troops. The Bolsheviks will supply the Czechs with coal and receive gold taken from Irkutsk in exchange. After the signing of the treaty the Czechs will not support Bolshevik enemies.

Interior conditions.

The congress of Soviets was supposed to be held every six months, but in point of fact no congress was held during 1919. This congress sat at the end of January and the beginning of February, in

particular connection with the ratification of the peace treaty with Esthonia.

At present there seems little hope of true political representation in Russia. Voting is not secret, and the Bolsheviks strongly control both the voting and the electioneering.

The cooperative societies are no longer allowed representation or to conduct electioneering. This order has been given owing to the fact that in the cooperative elections held in the Volga area under more peaceful conditions only 5 per cent voted for Communists, whereas in Petrograd the percentage was 40.

System of political representations.—Laborers, soldiers, sailors, peasants, and Cossacks in any particular district or town form committees of which representatives are elected to form the town or district or army Soviet. This Soviet elects representatives to form the Moscow Soviet.

This Moscow Soviet elects:

(1) A president.

(2) The all-Russian people commissars who form the council of commissars.

(3) The executive committee.

The soldiers', sailors', etc., committees and the district, town, or army Soviets elect their own council of commissars and executive committees.

The executive committee in Moscow then directs all these subexecutive committees direct, *and not* through the district Soviets.

The council of commissars directs in the same manner.

There is at present no real system of representation, as the soviets are a farce, and have practically no power, as the central executive committee, at the head of which is Lenin, directs everything and influences the selection of representatives in all soviets.

The rising generation.—In a way, perhaps, the most serious problem of Russia, and the one most neglected, is the human regeneration. The Russian character, naturally emotional, weak-willed, and prone to exaggeration, is not likely to have improved during the last five or six years. The influence of war, the lack of education, and the constant surroundings of anarchy and bloodshed, the destruction of all that stands for culture and the finer sides of life, can not fail to produce the most disastrous effects upon the younger race of Russian men and women, and just at a time when their energy, clear-thinking, and moral system is required to be at its best, and if other countries have any policy toward Russia other than egotistical commercial enrichment, this problem must certainly be tackled with the greatest energy and sympathy. Even from the egotist's standpoint, it is to the interest of the allied powers to see that the future ruling classes of

Russia are at least sufficiently intelligent and educated to form reasonable opinions for themselves, and do not come completely under the influence of Germany, who will never have any other aims but those of Germany, and who will, for this reason, remain the eternal enemy of Russia.

Miscellaneous.—(1) In spite of the recent announcement, the death penalty is still being carried out, and it is doubtful whether it will be abolished.

(2) Moscow wireless states that the result of the reelection for the Moscow Soviet was 98 per cent Communists. Total, 117 Communists, 6 sympathizer, 2 no party.

(3) All property belongs to the State. Private ownership is forbidden. Wholesale requisitions take place continually, and no receipt is given for goods or property requisitioned.

(4) It is not known to what extent the recent report of Lenin that a people's assembly would be formed can be credited, nor whether his offer to withdraw the cancellation of foreign loans and offer mine concessions to allied powers is genuine.

Communications.—From the attitude of the bolshevik representatives at Reval it appears to be realized that a solution of Russia's main problem of regeneration lies in transportation. In general the ordinary facilities for moving from one part of the country have entirely ceased to exist. For instance, between Moscow and Kharkoff no passenger trains are running at all. Between Petrograd and Moscow only one train a day, which is partly goods train and partly a passenger train. In general civilians are unable to travel, and it is not uncommon for passengers to have to get out of the train in order to get wood to supply the engine. Except for a few main roads, Russia has, even in its best days, been badly off for transport by road, and the organization of labor has up to the present been so deficient that no repairs have been carried out for several months.

Rolling stock has decreased to 30 per cent, the remainder being now laid up for a long time awaiting repairs. On some lines parts have been taken up and laid down again elsewhere to repair the lines necessary for the army. On the Brest-Litowsk-Moscow line one of the two parallel lines has been removed completely for the construction of new lines on the south Russian (Deniken) front. It is noticeable that the lines removed are mostly those which Russia, on the advice of France, had laid near the German frontier, evidence of the important part Germany is playing in the military life of Soviet Russia.

It is also reported that owing to the general disorganization and lack of construction work their transport by river barge will not be properly reestablished for some time to come.

Under these conditions it is clearly impossible for the country to reestablish the normal conditions or for any measure of prosperity to be attained. It is believed that any assistance from any country would be very welcome and would be backed up to the best of their ability by the Soviet government, and it should be remembered that until some such steps are taken the prospects of trade relations, upon which such store has been set by most allied industrial firms, are likely to be little short of hopeless.

Postal and telegraphic communications are in a like condition, with the exception that there is not quite the same urgent need for telegraphic material. No postal fees are now being charged.

Agricultural.—Agricultural conditions have mainly been determined by the following factors: Lack of labor, lack of transport, and lack of the necessary implements and machinery. With the advent of the latter, as a result of the opening of trade relations, the agricultural conditions of the country will probably recover sufficiently to supply in abundance the needs of the Russian population, but until the large problems of transportation and financial relations of the outer world are solved it is doubtful if sufficient products of this nature will be available to relieve the necessity which is now being felt throughout central Europe.

Industrial.—The factories, mines, and mills have been so neglected that in many cases they would have to be rebuilt. Workmen have long been idle and industry has been confined almost entirely to supplying the needs of the army. The regeneration of industry in Russia depends entirely on the provision of means of transport and technical machinery, there being no factories at all capable of supplying such essentials.

Assistance in both these cases must come from outside sources. If, and when transport facilities permit, there probably exists sufficient coal for the present needs of any factories as may be put into working order.

Attitude of the party in power.—Attempts to adopt communistic principles to Russian industries have brought them entirely to a standstill.

Since the end of 1919 the Bolsheviks have been gradually changing their economic policy, and the power of the workmen's council is being supplanted by the dictatorship of so-called specialists.

At the head of this new policy, which is being built up on the lines of capitalistic industries, stands Krassin, the former director of the Russo-German firm, Siemens & Schuckert. Private enterprise is permitted, but all produce goes to equip and supply the Red Army. A special commission for army supplies protects these private enterprises from requisitions and the Soviet government pays them liberally.

Recently, owing to the opposition of the Communists to Krassin's methods, Trotsky has brought forward a project for the militarization of industries and the organization of labor armies with military discipline, thus the Soviet government in adopting methods of compulsion with the working classes.

Generally speaking, one can observe that in Soviet Russia the Bolsheviks have discontinued the prosecution of speculators, closed their eyes to the colossal profiteering of those who are working for the defense of bolshevism, and are definitely compromising with capitalism.

Financial conditions remain as ever—chaotic. Prices are enormous, and in many cases wages and selling prices also.

A case is reported of one family whose expenditures for a month was over 1,000,000 Bolshevik rubles.

No budget has been prepared, and such financial statements as have been issued have been incorrect, out of date, and circulated only to a very small extent.

Bolshevik money continues to be issued, while at the same time Kerensky, Tsar, and Duma rubles are still current. From time to time the value of one of these currencies rises for no known reason, probably the result of Jewish handling of the market, as there exist in Russia and in the Baltic Provinces quite a large class of human beings who have no means of subsistence other than speculating in the various markets.

The manufacture of false money continues. So far English pound notes, believed to be fairly good, and English 5-pound notes, reported very badly made, have been put into circulation. Dollars, Swedish kroners, and French francs are expected to be issued shortly. These will probably be used for propaganda.

When the Bolsheviks came into power in Russia there were 1,100,000,000 rubles in gold in the State bank. Through the Brest-Litovsk peace treaty 150,000,000 in gold was sent to Germany leaving 950,000,000, of which 400,000,000 to 500,000,000 had been evacuated from the capitals to Penza, where it came into Kolchak's hands. The greater part of this probably eventually found its way into foreign countries.

The remainder, 450,000,000 to 500,000,000 rubles, remained in soviet Russia, but owing to the bad control and administration by the Bolsheviks it is more than likely the greater part of this has found its way into private pockets.

Gukovsky, soviet representative in Esthonia, stated that 35,000,000 Tsar rubles have been deposited in Esthonian banks.

Propaganda.—"Isvestia" is still active for universal revolution, and reports that schools are being established in Moscow where

officers are being taught foreign languages for the purpose of military command in foreign areas.

A proclamation was recently circulated in Reval, calling upon the laborers to overthrow the present government and establish soviet régime.

Col. Malone, M. P.—The impression conveyed by Col. Malone, M. P., as regards the conditions of affairs in Moscow, is entirely erroneous. No attempt was made by him to consult Mr. North, the British chaplain, or any independent opinion. The impression conveyed by him to the British public is entirely false and one-sided, and favorable only to the Bolshevik cause, which seems to have his sympathy.

A secret conference is reported to be held in Moscow, during which Kamenev and Zinoviev were strongly in favor of confining their propaganda activities to the East, as they feared greater opposition should they continue offensive action against Poland.

International revolutionary propaganda was originally directed by the foreign office, but is now in the hands of the office of the "Communist International" (Moscow, No. 5, Deneshny Pereulok), an organization independent of the Soviet government. The president of this society is Sinowjero, and amongst the members are Lenin, Bucharin, and the secretary, Bersin, a Lett. The only foreign member is Rudsjanski, a Hungarian. Up to September none of the European States had delegated anyone. Klinger, a Russian German, runs the business side of the society.

Lenin is connected with the office by means of a direct telephone line, and immediately receives letters and papers on their arrival. He often receives couriers for the purpose of obtaining first-hand information.

A limited sum from the government funds is at the disposal of the society for foreign propaganda. Funds for revolutionary organizations in foreign countries, which are usually in the form of diamonds or pearls, are smuggled over the frontier in doubly lined leather or in hollow heels on boots. In the cellar of Denishny, No. 5, Moscow, is a workshop where the packing of the valuables is carried to a high art.

The literary section of this society issues a monthly periodical called the Communist International, in Russian, French, English, and German, and correspondence in the same language. In addition to these, numerous brochures in the different European and Asiatic languages are prepared. Correspondence to be smuggled through is printed on thin silk paper.

Communication with the outside world is very uncertain, papers often not arriving for three to four weeks. Socialist papers appear to be more valuable as representing the opinion of the country and

there is less censorship than is the case with the few Bourgeois papers. Counter articles, in answer to articles which deviate from Bolshevik politics, are generally written by Lenin himself.

The route from Russia westward for couriers, who generally travel as released prisoners of war, is usually via Kovno, but the route via Latvia is also used.

Internationalism is still being carried on energetically, though it seems to have been the subject of a sharp discussion.

Lenin is for active propaganda, warfare all over the world, starting in western Europe.

Trotsky favors a concentration of energy on India and the East.

Radek is reported to have advocated a suspension of all outside propaganda, all energy to be concentrated on their own territory.

REPORT ON TRIP TO FIUME.

Source: Lieutenant (j. g.) W. D. Sample, U. S. N.

27 April, 1920.

While at Trieste on 15 April I was introduced to the secretary of foreign affairs of D'Annunzio at Fiume. During our conversation he asked a Red Cross officer who was with me and myself if we would like to see Fiume, and as he assured us that he would see that we got in and out without trouble we accepted. I considered this an excellent opportunity of obtainiing first-hand information there in place of the second-hand information I had been obtaining up to that time.

We left Trieste by train at 2.30 p. m. on 16 April and arrived at Fiume at 7.30 p. m. We were in civilian clothes, but I traveled with my regular Navy passport. At Mattuglic, the station of Abbazia, we had our passports and baggage examined by the regular Italian forces. At the station at Fiume our passports were inspected again, but we got through without any difficulty. We drove directly to the Hotel Europa, which we found mostly vacant, except for the military, and easily obtained rooms there.

We found the city in good order and as clean or cleaner than Trieste with a good many civilians on the streets taking their usual evening walk.

On our way to the "Palace" for dinner where D'Annunzio has his quarters and mess, we passed him walking with another officer. He was not at mess that evening nor at any of the meals that we had there. His mess was set for about 25, all of whom were members of his personal staff or heads of departments, but only about half of them were ever at table. Among those at mess were two Italian colonels and several other officers. There are also two generals on his staff, but they were not present. We were treated very well, but not much notice was taken of us either one way or the other.

After dinner we were allowed to wander about town by ourselves. There was a good deal of life in the evening, and there seemed to be no 11 o'clock closing law, as in Italian cities, as all cafés kept open until about midnight. We stopped in the café of our hotel, where we were recognized as Americans by the "Slav" orchestra, which played some American music for us. We always spoke English, but very few people took notice of it, and in the stores most of them were pleased to see some Americans. We were told that if anyone should desire to know what we were doing there to tell them we were guests of D'Annunzio.

The next morning we took a walk through the market, which we found well stocked with fresh foodstuffs that come over every morning from Sussac. The prices seemed to be about normal, meat costing about 10 or 11 lire a kilo and fruit and vegetables about ordinary prices.

Later we went to the "Palace" but learned that "D'Annunzio was out and that we would be unable to see him." We then went for a walk with Mr. A. down to the Sussac Bridge, which he said we would not be able to cross, but we went across anyway and were not questioned at all, and we even lined up the guards at each end of the bridge and took pictures of them. In Sussac we found another well-stocked market. The city, however, was not kept up as well as Fiume proper. The streets were crowded with people, a great many of whom were Italian soldiers, and the civilian population was principally Slav.

We had intended leaving Fiume that noon, but were told that if we waited over we should have a talk with D'Annunzio. We waited over until 4 o'clock without seeing him, and then waited the rest of the evening but could not see him. They told us that he had been out with his troops all day and was so tired when he got back that he could see no one.

The next morning we went to the "Palace" and called on D'Annunzio. He was very pleasant to us and was not at all bravado and loud-mouthed, as one might suppose from reading his proclamations. Among other things he said that he expected nothing from the San Remo Conference. The Red Cross officer told him that he expected to go to Riga soon, and asked him what he thought of Bolshevism. He said that he was very much interested in it and thought there was a great deal of good in it without all the terrorism. He was getting up a new constitution for Fiume and expected to embody several Bolshevik principles in it. He said that he was sure that he had a great many supporters in the States. He was very pleasant and very agreeable to talk to, but we were able to see him only a few minutes, as he was leaving immediately for his aviation field to receive

three of his aviators who had been flying over Italy the day before with proclamations.

There were no socialist signs in the city, the only posters being for the King, "Viva irre," which were quite numerous. We mentioned this to Mr. A., but seeing that it was a touchy subject with him I asked an American in the Fiumani Corps about it. He made light of it, and said that there had been a little agitation there of a "small minority," who had put up all of these posters.

He said that as Fiume could not go on the way it was indefinitely and as the Allies would not permit it to become Italian it would be necessary for them to form an independent republic, which would exist until such time as it could be annexed to Italy, which, of course, was the ultimate object in view. It was the forming of this republic that this "small minority" were opposed to and had, consequently, made some agitation to remain with Italy if possible, and had put up these posters. It seemed to me that this "small minority" was most probably a large majority of the civilian population of the city, and there was much more to this than he seemed to make of it. It was the constitution for this republic that D'Annunzio had told us that he was working on. We asked how they expected to exist as a republic, and he said through the assistance of the League of Fiume. He said this was a league being formed to get justice for all the small nationalities that had been wronged by the treaty of Versailles, as the Fiume movement was not only to obtain Fiume for Italy but was a general protest against the injustice of the treaty. He said that delegates of the league would meet in Fiume, and would come also from Ireland, Egypt, and India. When I asked him what they expected to accomplish he said that the first thing would probably be the breaking up of the British Empire. He would not admit that Great Britain, France, and the United States were the controlling powers and that their opposition to the Republic of Fiume would make any difference. He told us to wait and see.

It was apparent from this conversation, as well as with others, that they were all living in the air and that they had talked with themselves so much about this situation that they had fooled themselves into believing that it was of sound reality. The whole staff of D'Annunzio was typical of the character of the whole experiment. With the exception of the few senior officers, those of the staff were all youngsters, who would probably just as soon have been in China as in Fiume if it offered as much of an adventure.

The department of foreign affairs was the only one seen by us, but it can probably be taken as typical of the other departments of the organization. There was no sign of organization in that department, everyone doing what was convenient to him in his own way, and from the importance they attached to the most insignificant matters

it was apparent that they were not often occupied with matters of much weight. The whole organization seemed to be of such a nature that it would simply cease to exist were D'Annunzio taken away.

In the harbor made fast to the inner side of the breakwater were the R. N. *Dante Alighieri* and the *Merabello*, and made fast across from these with their sterns to the mole were the destroyers *Bertani Nullo* and *Abba* and one small torpedo boat without name. There were also about 5 or 6 M. A. S. and about 10 small merchant ships in the harbor. The men of war all flew the Italian ensign and all followed the *Dante* in making colors in the morning and evening and apparently a regular watch was stood on deck on all of them. Regular steamers run into Fiume and take in supplies as well as passengers. Supplies also come in by train. There was no apparent shortage of any of the essentials in Fiume.

The stores were all open as usual, but all seemed to be poorly stocked, and the large majority of storekeepers with whom we spoke were very dissatisfied. At the hotel the managers were very open in their talk against the régime there and expressed their dissatisfaction very plainly.

We left Fiume on the noon train 18 April without any trouble at the station and went through the passport office at Mattuglic also without trouble and arrived in Trieste about 5 p. m.

I found out afterwards that Mr. A was in Trieste at the time I met him to sound out the labor party there to see what support they could get from them in case of forming a republic at Fiume. He found no support at all there.

ORDNANCE.

MISCELLANEOUS ORDNANCE NOTES.

Source: Reliable.

(12604.)

22 June, 1920.

The following points discussed with one of the officers of the D. N. C.'s Department of the Admiralty give his views of various ordnance matters as learned in conversation. They are not, in all cases, perhaps the consensus of the general opinion on the part of the Admiralty, but they are carefully considered ideas of an extremely well-informed ordnance officer.

Caliber and Range of Gun for Light Cruisers.

The present firing of British cruisers at extremely long ranges on battle practice was discussed. He had not the exact figure, but he placed the extreme range of the 6-inch cruiser guns at 22,000 yards, rather than at 24,000 yards; and the 7.5-inch gun he thought ranged less than 29,000 yards, perhaps about 27,000, as this particular gun fires a rather blunt projectile of only 4 caliber radius ogival.

Personally he was against the 7.5-inch gun on very light craft. He said there were two ways of looking at it. It was a very attractive idea to be able to have a 7.5-inch gun mounted so that it would elevate to an extreme angle, and which would give a range much greater than that of the guns of existing battleships. If such a cruiser met a capital ship it could stay out of range and fire at it undisturbed. It would, until destroyers or other craft drove it off, be a great annoyance. If the idea of putting guns on light cruisers was to be an annoyance to capital ships, he thought that a 7.5-inch gun was an excellent caliber. But he did not think that the idea of mounting guns simply for this purpose was a sound one. Capital ships could stand the fire of other capital ships and therefore would be perfectly safe from this sort of attack.

On the other hand, the thing for a light cruiser to do was to get information and get out of the way or fight destroyers. For fighting destroyers a 7.5-inch gun, he thought, was much too heavy. Loading arrangements and the weight of projectile made the rate of

fire in a seaway very slow. He was not so sure but what a number of big destroyers or flotilla leaders with 4.7-inch guns could fight it very successfully in any sort of sea.

As regards fighting other light cruisers, he thought 6-inch guns big enough to sink any of them. Even if they were not of sufficient size, he thought the primary mission was to engage the lighter craft and not to engage in any elaborate long-range gunnery duels.

He thought that there were two extremes in batteries of light cruisers based upon two different sorts of duty. One sort of work consisted in long-range engagements in heavier ships which were outranged. If that were the type of work required the *Furious*, *Courageous*, etc., was the answer. The other kind of work was to beat off the attack of lighter vessels, big flotillas, and destroyer leaders, and for that he thought the 6-inch gun more useful, particularly as the 7.5-inch is found to have a low rate of fire.

Between these two kinds of guns, namely, the 6-inch and the gun of largest caliber, he saw no middle ground. At least, though the conditions might probably sometimes be ideal for a 7.5-inch, the percentage of cases where this was so would be so small that it would be an unwise caliber to build. He preferred the 6-inch and was not of the opinion that cruisers like the *Furious*, *Courageous*, etc., were entirely absurd. He was opposed to them but there was a certain amount of logic in that construction. He thought there was no logic at all in building 7.5-inch guns which were neither one thing nor the other. He said there was a good difference of opinion, however, in the British Navy and that one reason why they had put them on was that when they had their ships designed there was not much space left on the center line and they could get in about as many 7.5-inch guns as they could 6-inch. They therefore put them in for good measure.

NOTE.—Was the idea entirely disconnected from our battle-cruiser armor?

While stating his personal preference for a 6-inch gun, he made it clear that he meant a 6-inch gun capable of great elevation, at any rate well over 20°. Such a gun could, if necessary, fight at a range where even 7.5-inch guns, particularly in rough weather, could do little harm. He said that from study of their designs there seemed so little sacrificed by giving the guns good elevation that he thought it indefensible to fail to make them elevate to about 30°.

From the foregoing it appears that the rate of fire of the 7.5-inch gun is rather slow. It appears also that, in arming the recent cruisers with 7.5-inch guns, one circumstance which led to the decision was that on the center line they considered there was not room for any more 6-inch guns than there was for 7.5-inch guns. The 6-inch gun which he preferred he wanted to elevate to at least 30°. This was im-

portant, because then it could fight off even 7.5-inch gun cruisers at ranges when there would be little hitting on either side. The main point was that, as he pictured it, their business was principally with big destroyers and flotilla leaders, and, considering the difficulty of loading the 7.5-inch gun, he thought a 6-inch battery would be more rapidly worked and more effective. With director firing he thought that, even in a seaway, the pointing would give no difficulty. It was the loading with sufficient speed which he thought would be troublesome.

Class A Armor Plate.

It was learned for the first time that the British system of plate testing is to fire at each plate in such a way as to determine its ultimate resistance. Then the makers are paid not a flat amount for simply exceeding a minimum but a combination of a flat rate merely for passing test, together with an additional bonus, dependent upon the amount of margin by which they have exceeded this requirement. At the end of a year one maker would come around and would be very proud of his showing. His bonuses would be a definite incentive to improvement and he could tell from how he was coming out how his work compared with that of other makers. The Admiralty, besides furnishing an incentive, and a financial incentive, toward improvement, would each year be obtaining information on what the next year's specifications could be raised to. He thought it a very valuable scheme. They have had it for some years. It made all the armor makers very keen and made them aim not simply to pass in the specifications but made them attempt to increase their profits. It seemed analogous to the old bonus for speed trials on naval vessels, without other certain disadvantages which applied in that case. He said that already the makers were attacking the problem of "special oblique impact armor," which was something which has already been reported. The Admiralty's great difficulty now is that they have to keep development going without being a purchaser, and the difficulties of furnishing an incentive for improvement are now much greater than when they could buy large quantities of plate on this bonus scheme. They have not found it possible to apply the bonus idea to projectiles.

Comparative Methods of Testing British and American Armor.

As stated previously, our own experimental work in oblique impact has been to take belt armor of about $\frac{1}{4}$ caliber thickness and fire at it at the greatest angle at which attack was possible. This was not much over 10° or 15°. In England they have gone at it somewhat differently. They have picked out bigger angles (all projectiles are

tested at 20°) and have used thinner plates—i. e., on the order of two-thirds of the caliber, or down to 7 or 8 inches for 15-inch attack.

It is interesting to consider the reasons for the difference between these two ideas and what the matter leads to. The Admiralty started with the idea that oblique impact projectiles were necessary. They wanted to make the conditions of the test simulate very oblique impact. They had available a large quantity of thinner plate, such as was used on British battle cruisers. They had German battle cruisers with about the same thickness of plate which they might have to fire at. It was easier and more natural for them to take thinner plates at bigger angles than it was for us with principally belt armor plates available at our proving ground. Also time was a great element.

They considered that in the development of oblique impact projectiles it was better to make the obliqueness very extreme in the tests and later improve the thickness rather than to work as we did with one caliber plates and hope to increase the angle. They thought the angle had already been determined.

It seems quite probable from the different ways in which experimental work has progressed in the two countries that our own projectiles will go through one caliber plate at a bigger angle than British projectiles will and, on the other hand, British projectiles will at a big angle go through thicker plate than our own will. This may be considered as the most probable characteristic which distinguishes the performance of British and American projectiles.

He was told that Sir Robert Hadfield had recently discussed supplying projectiles to the United States Navy under 20° specifications, and that by 20° specifications he said not at plates of the thickness that we fired at in England but at thicknesses such as we used. He said that if Sir Robert Hadfield was able to do this he would be doing in the United States more than he had so far shown signs of doing in England, and that he thought that Hadfield was over optimistic. He said that he thought Hadfield had not clearly distinguished between the two lines of experimental work in England and in America and was taking a big chance in trying to jump from their angles to our plate thicknesses.

At the present time Hadfield is supplying for test, and free of charge, the 16-inch projectile which he guarantees to get through a thick plate at 20°. From our knowledge of angle multipliers we would imagine that he would need a velocity more than he has proposed. We think we know more about this particular kind of test than he does. They have done practically no firing at all in England on angle impact at one-caliber plate.

The officer thought that of the two lines of research that theirs was quite as good or better than our own. He thought that it would

bring out more quickly the best features for very oblique impact, and if the projectile were to strike at 30°, due to the angle of fall, he would prefer a projectile which penetrated the most armor at that angle rather than one which would be developed, as in the United States, to penetrate one-caliber plate at as large an angle as we could work up to. When they got 8-inch protective decks he thought that their work would take them closer to real conditions.

Protective Decks.

They have been doing a great deal of work on protective decks, but have so far produced no protective-deck penetration formula, although some of their people are now at work on one. Their new projectiles now penetrate 5-inch roof armor, which prewar projectiles would not get through. They are not well pleased at all with their high-tensile steel.

During the war we sent over to England for test a plate of our special-treatment steel as used on protective decks. They stated that, compared with their own high-tensile steel, the high-tensile steel "was not in a class with it." The great trouble with high-tensile steel is that it shatters badly and large and ugly pieces of it are thrown about. The officer stated that high-tensile steel was something which was of great convenience in certain place in ship construction from the point of view of furnishing great girder strength, etc. As regards the protective qualities of it, however, much was taken for granted. The ordnance people were very little interested in it from the point of view of testing it for protection, or at least that had been the case in the past. The constructors, when they have the high-tensile steel design and built into a ship, would use a rather ambiguous term in implying that it had some protective qualities. No one would say very much about what its capabilities were. The constructors had used it for their own special purposes and the ordnance people had never had any special enthusiasm about going into the matter and seeing that by test it was the best for protection. Their attitude was principally one of overlooking it entirely, because from the way in which it was named and from the conditions under which it was built into the ship, they had no special responsibility which would force them to improve its qualities. He said that recently everyone had begun to take more interest in it.

There appears in England to have been no experiments along the lines of those where we tried laminated deck plates some years ago at the proving ground, and, on the basis of successful results, used them in ships. Older tests of laminated armor at normal attack had generally discouraged everyone and thrown them off the track so that

for the special conditions of deck plate armor it was never given a thorough test abroad.

It is understood that in using high-tensile steel, high-tensile steel rivets are employed. If one starts to calk a leaking rivet of this kind it often cracks badly and goes to pieces and falls out and often, below the water line, a wooden plug has to be temporarily used. This had been objected to in some quarters, but the objections were met with the argument that, under gunfire, British light cruisers during the war had done exceptionally well and probably this kind of rivets was as good as any other kind.

Ultimate Thickness of Protective Decks and the Kind of Armor to Use for Them.

In the discussion of the *Hood*, Admiral Chatfield said in a statement, which has been widely commented upon, that if they were rebuilding the *Hood* they would not build it the same way. Part of this statement is generally believed to mean that a certain amount of speed would be taken off in favor of a generally somewhat thicker armor protection. And the principal place where it is believed they would modify the armor protection is in the protective decks and other horizontal armor. It is difficult to guess what future British ships will look like during this period of discontinued construction. But it has been frequently stated in these reports as an opinion that when British post-war construction is finally announced, it will include a most remarkable thickening of the protective decks. They will probably also improve on this "high-tensile" steel.

Nothing in this conversation semed to lead to a contrary opinion. "I do not know but what some day we may come to a half-caliber protective deck," this officer said. It seems as though the question of cost is coming in to this. A number of well-informed people have spoken very favorably of the idea of face-hardening the protective deck armor when its thickness has increased sufficiently. But when that happens it will increase the cost enormously, particularly in England. With us there would probably not be so much difference, as class B armor is evidently considerably more expensive than the high-tensile steel used in England.

If in the general process of increasing the thickness of protective decks we get to thicknesses where face-hardening is necessary, we may then have to give up laminated deck plates which are thought, for the smaller thicknesses at any rate, will be of considerable advantage.

This officer said that for every oblique fire, although they needed some sort of face-hardening in all probability, it was difficult to say

just what sort was best. Their experience had been that, when armor corresponding to our class B armor had been attacked at about 30° from the normal, homogenous plate was about as good. Still, he thought that for an angle of fall of 30° to 45° on a deck plate or turret roof 6 or 8 inches thick, face-hardening was of considerable benefit. He was asked if they had tried noncemented plate in this connection and stated that they had not.

Horizontal Armor on Several Decks.

He was asked whether he considered it preferable to group all the horizontal armor in one protective deck or whether to have it in several protective decks. He said that, from the point of view of fuse action, if one could break up the explosive shell by an early burst there was a good argument for putting a lot of thick plating on the upper deck. He said that it also was an advantage to the naval constructors to allow them to build ships this way and work in their "high-tensile" steel for strength purposes. He was asked if he was familiar with any effect by which the projectile, in going through a thin course of plating on the upper deck, would have its angle of fall increased by the passage through this plate so that it struck the deck below at a steeper angle and had its penetrative power increased because of the steeper angle. He said that about 1-inch plate, he thought, would have no effect on this but that for 2 inches or so they had actually found that the path of the projectile was altered and that the extra angle of descent made the projectile go through the deck below seem better than it otherwise would have done. He thought it was all wrong to put the horizontal armor in too many layers on different decks where the thickness of these layers exceeded about 1 inch. He thought that with our "all or none" scheme of armor protection and very thick protective decks we were well off in this regard. The effect which was suggested to him and which he said he had noted had come to light fairly recently in proving-ground tests. They fired at a built-up structure but, instead of the deck plate being put nearly horizontal, it was swung around so that it was vertical and with one edge advanced more than the other, thus obtaining the desired angle of impact. It was as though everything had been rotated through 90° about the line of fire.

20-Inch Guns.

This officer thought that 20-inch guns were very good. He thought that the case for the 20-inch guns was already proved as a matter of gunnery and ballistics and destructive effect on penetration. Not,

perhaps, in an absolutely conclusive way so that nothing else would be anywhere near so good, but, if one had a free choice, it would be the kind of caliber to select.

He thought that the financial conditions had also to be considered. The great disadvantage from the Admiralty point of view of such construction is that the cost and size makes the number of units so small that it does not fill the most immediate need for the requirements of the British service. He thought that with so many possessions all over the world it was quite necessary to have numbers supplied first. If they concentrated all of their efforts and put the whole appropriation into one enormous ship like this, it could only be at one place at a time, and would not be so useful as several smaller ones, particularly as it would be for many years an odd size. It would be against their interests to start the fashion. It would be a much more appropriate construction for a country whose fleet could go intact and attack parts of the enemy's forces than it would for a country which must cover so many parts of the world and could not be certain which part of their forces would be engaged.

Experiments with Projectiles with Vanes, Corrugated Caps, etc.

The ranging of the projectiles with the corrugated caps, which were expected to reduce rotation progressively during flight, and so decrease dispersion, was not a success.

Rifling.

He believed in deep rifling with wider grooves than lands. He thought the lip on rotating bands should not be all the way aft, as they had had trouble with fringes when it was in that position. He believed thoroughly in uniform twist. He thought that one turn in 50 was right for extreme ranges and said that it had been their experience that best results at long ranges were obtained with very mild twist of rifling. At shorter ranges a steeper twist was a little better, but not much. He thought a twist of "something under 50" was about right.

He noted that the German rifling was a very square section and little rounded in the corners. He thought it was as good as any, but that the main idea was to decrease the amount of work done by the rifling, (*a*) by giving it the minimum amount of twists, and (*b*) by making the grooves wider than the lands. Also the bands should be favored as much as possible by using uniform rifling and keeping the lip forward so that it would not fringe out. He did not think there was much more to the matter than that.

CALIBRATION FIRINGS.

Source: French Ministry of Marine.

(13258.)

June 25, 1920.

The object of calibration is to attain and maintain, amongst the guns of a same vessel, minimum dispersion at battle ranges.

In general, minimum dispersion of guns is considered to be attained, for a given distance, when the deviation from the greatest normal error in range in absolute value does not exceed half of the danger zone of a target 8 meters high and 21 meters wide, calculated for the distance considered and with respect to the guns used for the ranging.

The deviation from the normal dispersion error in range of a gun for a given distance is defined as follows:

Let D be the range of a gun fired on experimental mount at the proving ground, at an angle $i=(a-e)$; [1] using an allowance of mean velocity powder, the longitudinal component of wind being nil, and one cubic meter of air weighing 1,208 kgs.

Let P be the range of a gun of same caliber, fired on board ship, at a similar angle i, with the same allowance of powder and under similar atmospheric conditions.

The difference $E=P-D$ is the normal error of the gun for the distance D.

This normal error results from the conditions of installation of the gun (mount and platform) and the difference of wear between the gun at the proving ground and the gun under consideration.

There are two kinds of calibration firing:

(*a*) Calibration of new vessels, for the purpose of establishing or checking the dispersion of the guns of the vessel for an assumed battle distance.

(*b*) Half yearly or yearly calibration firings for the purpose of maintaining minimum dispersion, under firing conditions of target practices (reduced charge, powder allowances differing from the mean allowance, firing distances differing from those assumed above).

Calibration of New Vessels.

Within three months after being commissioned with complete complements and joining a squadron, new vessels are calibrated under the following conditions:

Firings are held upon the request of the commanding officer, after he has informed the commander in chief that the crew to be employed, especially the gunners, have received sufficient training to warrant the firings being carried out under good conditions.

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[1] Angle of projection—angle of jump.

The firings are held at one of the two naval proving grounds under the supervision of a board composed as follows: The president of the permanent board of ordnance of the squadron, president; the commander of the vessel, the commander of the staff of the commander in chief in charge of ordnance, the ordnance constructor attached to the squadron staff, the naval constructor attached to the squadron staff, two officer members of the practical naval ordnance board ("Commission d'Etudes Pratiques d'Artillerie Navale") designated by the president of this board,[2] chief of the ordnance service of the vessel, and one ordnance constructor from the service which effected the assembling, secretary.

The necessary ammunition is issued upon the board's requisition.

The powder charges having been standardized in weight, the lines of sight carefully corrected, the projectiles weighed, the firings are executed in fine weather (velocity of wind 6 meters per second, limit of rolling 1°):

(1) The vessel conducting the fire and the target (of large dimensions) are securely moored athwartships.

(2) Five shots are fired with each gun of the vessel (seven shots if any are abnormal[3]) in order to obtain for each gun a mean center of impact at a distance of 1,900 meters and at the battle range determined upon (this distance is determined for each vessel by the general staff). The gunners, few in number, are carefully selected. When the rolling of the ship is not entirely nil, the aiming is completed and the shot fired during the period of rise of the oscillation and toward the end of this period.

(3) On board the vessel firing, at each shot:

Observe the strength and direction of wind (its velocity in the plane of fire should not exceed 6 meters);

Observe the elements necessary for obtaining the weight of one cubic meter of air (temperature, pressure, hygrometric status);

Verify the bearing of the line of sight;

Establish by means of "segments capables" (segment in which a given angle may be inscribed) the position of the bridge;

Measure the distance from the gun firing to the bridge to determine the exact distance from the muzzle of the gun to the point of fall;

Measure the limits of vibration of the platform directly supporting the gun;

Measure the vessel's rolling;

Measure the angular distance between the observation station and the point of fall (with a sextant).

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[2] For the firings carried on at Quiberon, the two members of the C. E. P. A. N. were replaced by two members of the Gavres Board designated by the president of the board.

[3] A shot is "abnormal" when there are more than three mean deviations from the tables of the average center of impact considered.

(4) On shore, near the vessel:

Determine by means of segments and lines of direction, at each shot, the distance from the bridge to the target at 1,900 meters. This observation should be made by two observers either at the same station or at two stations correctly determined on the chart.

(5) On shore, abeam of the target at 1,900 meters, have two observers measure, with the maximum precision obtainable with the camera apparatus employed for measurement, or, if necessary, with special taximeters of great radius, the angle between the point of fall and an accurately defined zero line.

During the long range firing measure with same precision the angle between the point of fall and the observation station situated parallel to the great distance target.

(6) On shore, parallel to the points of fall at great distance, measure with the same instruments and same precision as mentioned in (5) the deviations of these points of fall from a well-defined zero line.

All these requirements having been complied with, for the distance of each shot make the corrections for the influence of wind the weight of 1 cubic meter of air and the exact position of the vessel.

Calculate a mean center of impact for each gun, taking no account of abnormal shots.

Ascertain that no error can have been caused by unscrewing of the sighting apparatus. Correct accordingly.

Calculate the half danger zone corresponding to the guns to be calibrated for the battle distance determined by the general staff and for the theoretical 8 meters high and 21 meters wide target. The board draws up a minutely detailed report of the execution of the firings and the results obtained. This report is immediately forwarded to the department together with the board's recommendations concerning any useful measures to assure minimum dispersion at the range considered. In drawing up these recommendations it will be borne in mind that it is necessary, unless impracticable, to effect minimum dispersion by correcting the sighting apparatus and not by alterations of the transmitting apparatus. Upon receipt of the recommendations and the report of the board the department orders the necessary measures to be taken to effect the minimum dispersion of the calibers under the best conditions.

Half-Yearly or Yearly Calibration.

These firings are held for the purpose of maintaining minimum dispersion under the firing conditions and with the powder allowances used for target practices for the period of the year. They are consequently executed at the assumed mean distance of these target practices and with the powders used for these firings.

In order that this firing may give the desired results, it is indispensable that it be held after elimination of the causes of dispersion foreign to the particular normal error of the guns. Consequently, vessels will strictly follow the following prescriptions:

The firing is executed during fine weather, the component for the velocity of wind in the plane of fire being at a maximum 6 meters per second and the amplitude of rolling being 1° of each of the ship's sides. The vessel firing and the target are moored athwartships so that all the guns of the same side can fire approximately along the same bearing.

The distance from the vessel firing to the target is accurately determined. The lines of sight are adjusted before firing and verified after. The gunners, few in number, are carefully selected. The observers, provided with camera apparatus and the great radius taximeter, are stationed so as to be able to measure with precision the deviations in range (parallel to the points of fall and at 2,000 meters at most from the same). In case the reaction of the firing should cause the vessel slightly to oscillate, the shots should be fired at such intervals that the oscillations may have time to die. When rolling is not entirely nil, the aiming is completed and the shot fired during the ascending period of the oscillation and toward the end of this period.

During firing the temperature, barometric height, the hygrometric state, and the longitudinal wind component are noted. These data serve to calculate the range corrections necessitated by the variations of weight of the cubic meter of air, the velocity, and direction of the wind.

The target is one of large dimensions. When vessels have no large targets at their disposal, they may use a panel target anchored at a distance inferior to that corresponding to the sight employed with the reservation that account be taken of the angle of depression thus caused.

The firing is executed with at least one gun of each caliber and of each kind of installation; the gun of each of the categories selected for the firing is the one that has fired a number of shots which brings it nearest to the average number of shots fired by similar guns. The guns are using the same elevation. The corrections determined by previous calibration firings are maintained.

The ammunition is drawn from the yearly allowance. In case several lots of powder have been issued for the mean caliber guns, the ammunition will be taken from the greatest lot and will be used by similar guns. The commander in chief will determine the number of shots to be fired by each gun, assuming that three normal shots are necessary to make a sufficient grouping; the commander in chief has, moreover, the right slightly to modify the proportion

of ammunition to be selected for calibration. The object in view is to obtain calibration to a sufficient degree, and consequently to have a sufficient grouping for each caliber of each kind of installation. If therefore, in particular, the deviation of a shot from the mean center of impact of the grouping of a gun is greater than three times the mean error of the tables, this gun should immediately fire another shot in substitution of such shot at request of the measuring station.[4] In this case calculation of the position of the mean point of impact will be made by taking account of all the shots fired.

After the firing the difference between the sight employed and the mean range of each gun is determined. This difference represents, errors of experiment and measurement included, the absolute normal deviation for each gun employing the powder lot used for the firing. It is taken as granted that experimental and measurement errors may give rise, in the determination of mean ranges, to some uncertainty between two mean deviations of the tables.

A calculation is made of the half danger zone, corresponding to the guns used for ranging, for the theoretical 8 m. high and 21 m. wide target for the range under consideration.

When the difference between the elevation used and the mean range of a gun is less than the value of this half danger zone, plus two mean deviations of the table, a systematic correction, the value of which is equal and contrary to the difference observed, is made on the receiving instruments of the order transmitters of such gun and the guns of same caliber and same installation.

Calibration firings form the object of a special report, and are entered in the target practice record book.

The general results are stated by the commander in chief in a special chapter of the yearly general report.

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[4]Ammunition for firing substitution shots and supplementary shots for calibration firings, by order of the commander in chief, is taken, if necessary, from the ammunition allowance of the next target practice and is not replaced. Any remainders are used for target practices.

AVIATION.

VISIT TO R. A. F. EXPERIMENTAL STATION AT GRAIN.

Source: Reliable.

(6736.)

22 June, 1920.

The overhead wire carrying a loop on which an aeroplane may hook itself and so run to rest has been tried. Six attempts were made by one pilot without hooking the loop. An exceptionally skillful pilot, after two attempts, succeeded in hooking on the third, but did not know that he had done so, and left his power on and carried away the gear at the end of the run. No acceleration was given the suspended cable on the nine trials made. It is my belief that these attempts demonstrate the failure of the device. Pilots mentioned above were very skillful. The pilot should know when he has hooked on, either by signal from the ground or by a lighting device of some kind which would function on the contact of the hook with the loop. The pilot is laboring under the disadvantage of being unable to see his hook, which is located on the top of the upper wing. The opinion was gained that the operation could be performed, but doubts were expressed as to its real value, in view of the fact that a ship so fitted must leave formation to head into the wind, and to the difficulties entailed in hooking, due to the rolling and pitching movements of the ship.

One plane, it was noticed, was fitted with a fork, or wishbone device, identical with the 1913 Bleriot-Pegoud gear. This device, of course, needs no loop, but obviously needs a greater length of wire. It has not been tried at Grain as yet.

One pilot favored the present type of emergency flotation gear, but advocated the use of skids instead of wheel chassis. He proposed skids which should run in greased troughs in place of cumbersome turret platforms. These were tried with success, but abandoned because machines with skid chassis broke up when landing on the *Furious*. It has since been demonstrated that a great many machines break up when attempting to land on the *Furious*, whether fitted with skids or wheels. The troughs held the machines down, as well

as preventing lateral movement until flown clear of the ends. This is good for a rolling or pitching ship, and seems worth our trying very seriously. Skid chassis have the excellent qualities of lightness and may be easily fitted with hooks.

There is interest now in amphibian types of aircraft, especially for peace-time work. There are none at Grain at the present time, but the Vickers *Viking*, which will take part in the coming air ministry competitions, has been recently tuned up at Grain. This craft is a single-engine, four-passenger flying boat, with retractible wheels on each side, which may be drawn up clear of spray thrown off the chine. Details for all of the amphibian types will no doubt be available after the competitions, but it is natural that they are being guarded at this time. Trials of the *Viking* at Grain are reported to be successful.

The idea of putting skids under a flying boat was discussed with one of the pilots. He seemed to agree with the advantage of a boat which could be launched on two troughs (or by catapult) and land on a deck without running for any great distance. The hollow-bottom type is most convenient, but the scheme might be tried on an aeromarine boat.

In the matter of bogs for flotation gear, it was noticed that standard rectangular bags are in stock which fit into the bays of the fuselage of all ordinary machines. They are about 2 feet long by 2½ by 3. The idea looks useful; if the bag is too large it can be stuffed in place anyway. Three bags are often used.

The P–5 is said to climb much better than the F–5 and to handle more easily on the water. The hull stays tight and is serviceable except for some delicacy when landing on the landing truck. The complete absence of water-tight bulkheads or even partial bulkheads was noted. The center of gravity of the P–5 is just over the front step. This causes the rear step to bear always and hold the boat in a good planing attitude. It does not porpoise and the pilot can not take the air before flying speed is attained. He can, however, when planing alter the trim three or four degrees by manipulation of the horizontal control. This quality is considered by some to be most satisfactory. Experience with the N. C. boat is similar except for the location of the center of gravity. It is an item of interest, however, that the P–5 type of boat hull has not yet been tried in very rough water.

A two-engine Handley-Page was noted in one of the hangars which had been sent down to Grain to be fitted with hydrovanes. It is believed that ultimately the air ministry will require all civilian aircraft flying over the channel to be fitted with these hydrovanes.

and air bags. In this connection it is necessary when flying aircraft, so fitted, from ordinary aerodromes, to keep the grass well trimmed.

Machines on the station, and obviously under test, were:

Parnall-Panthers, Nieuport, Night Hawks.

Fairey and Short seaplanes, F–5's, P–5's.

D. H. 10's, Sopwith Pup, and Kitten.

The most recent activity on the station has been the testing of flares and smoke bombs for navigational work and experimentation in forming barrages for torpedo plane attack. No details of this activity were obtained.

The commanding officer has now under his command 20 officers and 300 men, as contrasted with a complement of 1,500 during the war.

A 1,000-pound torpedo was noted. It is understood that a machine will shortly be developed that will carry the regular heavyweight service torpedo.

A Fairey seaplane was fitted with a trailing edge which could be dropped for the full length of the wing spread on both sides of the top plane. A device has been fitted for hauling down both sides in conjunction combined with the ordinary control. A small crane was noted in one of the hangars which is mounted on a truck for hoisting out engines. This appears to be a most useful appliance.

Concerning the *Eagle*, the following information was obtained:

The high smokestack on the side of the deck as fitted on the *Eagle* is considered an improvement on the system installed on the *Argus* and *Hermes*. The island or deck house on the *Eagle* is 80 feet long and is considered by some as altogether too long. Beside it is either an eddy, if a lee side, or a region of compression, if a weather side. With a rolling ship, planes are in danger of fouling this island. The plan was discussed of approaching the ship for landing while under the smoke and from a good distance astern to be able to carefully size up the situation. It is understood that the approximate 30-foot gap between the flying deck and lower deck on the *Argus* is not present on the *Eagle*. This gap is not nearly so great, which fact, it is believed, will enhance the confidence of pilots who have to land on board.

In commenting upon the wire-arresting cables it was stated that these should be kept extremely taut and from about 1 foot to 16 inches clear of the deck. The sag may be taken up by boards on edge of 1 inch thickness by 10 feet in length, which the plane can knock down as it proceeds along the deck. It was considered very difficult to support freely a greater length than 200 feet of cable. It is understood that the practice is now to use $\frac{3}{4}$-inch galvanized cable-wire

cable for this service in lieu of the ½-inch previously used. Traps not now considered satisfactory, but a ramp at each end is deemed to be good.

Palisades are useful for stowing machines on deck and would be useful along the rail to keep machines from running overboard if provided with automatic erection mechanism so that they could be instantly run up on one side of the deck if the landing machine had a tendency to skid off to that side. They are not deemed suitable as wind brakes when landing.

The following details were noted and are briefly included as matters of interest:

The trailing edge on the P–5 wings is made of cord and is reported to give no trouble.

No veneer is used on nose of Parnall wings.

The steel fittings on P–5 are only painted and appear to be badly rusted.

A nonsymmetrical mounting of Liberty engines on D. H–10 gives no trouble. There is, however, a diagonal strut to the fusilage.

All F–5's on the station had balanced ailerons.

Stream line wires, and especially terminals, on the P–5's are rusted. They have been oiled only.

An eyelet is put in each rib space on under side of wings. Wings are said to fill with water, even when eyelets are not fitted.

Land machines fitted with flotation gear, after emergency landings on the water, should be rescued with utmost dispatch, and great care should be exercised in removing the plane from the water, as crude methods naturally result in severe damage.

The Cooper Servo method is liked, and no alterations have been made since 1918.

An advantage was claimed for steep runways for launching of heavy flying boats in spite of the difficulty entailed in dragging them up these runways from the water. This, however, is believed to be partially due to local conditions, where they have an 18-foot tide and occasionally 5 or 6 knot current, entailing danger to personnel when wading too far from the shore.

The experimental landing " deck " on flying field at Grain is flush with ground level. It is believed that this should be raised a certain amount to partially similate conditions in landing and taking off from shipboard.

AVIATION REPORT.

Source: Reliable.

(13238.)

May 22, 1920.

The following is a list of the various types of airplanes and seaplanes used in the Italian Army and Navy:

PURSUIT AIRPLANES.

Name.	Type.	Name of engine.	Power.
Macchi	Ni	Le Rhone	120/1, 200
Macchi	H. D	Le Rhone	120/1, 200
Spad	Spad	HS. 34	180/1, 700
Spad	VII Spad XIII	HS. 35	200/2, 000
Ansaldo	A–1 Balilla	S. P. A Semi. Surc	200/1, 600(215)
Ansaldo	P. Y	I F–V–6	260/1, 700
Macchi	M–14	Le Rhone	120/1, 200

PURSUIT SEAPLANES.

Ansaldo	Sopwith	Le Rhone	120/1, 200
Ansaldo	I. S. V. A	SPA–6–A	205/1, 600
Ansaldo	I. S. V. A	SPA–6–A	205/1, 600
Macchi	M–5	IF–V–4 B	190/1, 450
Macchi	M–5 mod	IF–V–4 B	190/1, 450
Macchi	M–5 2–s	IF–V–4 B	190/1, 450
Macchi	M–7	IF–V–6	250/1, 700

OBSERVATION AIRPLANES.

SIA	SP–3	Fiat A–12	260/1, 500
Saml	S–2	Fiat A–12	260/1, 450
Pomilio	PE	Fiat A–12bis	300/1, 600
Ansaldo	SVA–4	SPA 6–A	220/1, 600
Ansaldo	SVA–6	SPA 6–A	220/1, 600
Ansaldo	SVA–10	SPA 6–A	200/1, 600
Ansaldo	SVA–10	IF–V–6	250/1, 700
Sia	R–2	Fiat A–12bis	300/1, 600
Brequet	Bre	Fiat A–12bis	300/1, 600

OBSERVATION SEAPLANES.

Siai	FBA	IF–V–4B	190/1, 450
Macchi	L–3	IF–V–4B	190/1, 450
Macchi	M–8	IF–V–4B	190/1, 450
Siai	S–8	IF–V–4B	190/1, 450
Siai	S–8	HS–44, canon	220/2, 000
Siai	S–8	Colombo, F–150	200/1, 450
Macchi	M–9	Fiat A–12bis	300/1, 600

Bombardment Airplanes.

Name.	Type.	Name of engine.	Power.
Aer	SP–4	2IF–V–4B	190/1, 450
Caproni	Ca–3	3 IF–V–4B	190/1, 450
Caproni	Ca–4	3 Fiat A–12bis	300/1, 600
Caproni	Ca–5	3 Fiat A–12bis	300/1, 600
Caproni	Ca–5	3 IF–V–6	250/1, 700
Sia	9–B	Fiat A–14	685/1, 550
Ansaldo	SVA–5	SPA 6–A	205/1, 600

Bombardment Seaplanes.

Caproni	Idro Ca–5	3 Fiat A–12bis	300/1, 600

Training Airplanes.

Caproni	Ca–2	3 Fiat A–10	110/1, 400
Caproni	Ca–2	2 Fiat A–10	110/1, 400
		1 IF– V–4B	198/1, 450
Savigliano	S. P.–2	Fiat A–12	260/1, 500
Sit	Voisin	IF–4–4B	190/1, 450
Vickers-Terni	Farman	Fiat A–10	110/1, 400
Vickers-Terni	Idem	Anzani	95/1, 320
Vickers-Terni	Idem	Colombo	115/1, 350
Aer	Caudron	Le Rhone	90/1, 250
Aer	Idem	Le Rhone	120/1, 200
Vickers-Terni	Caudron	2 Le Rhone	90/1, 250
Gabardini	Gabardini biplane	Le Rhone	90/1, 250
Gabardini	Gabardini monoplane	Le Rhone	90/1, 250
Saml	Aviatik	Fiat A–10	110/1, 400
Saml	Idem	Le Rhone	120/1, 200
Saml	Saml, 6 Montanti	Fiat A–12	250/1, 500
Macchi	Ni, 18 m²	Le Rhone	90/1, 250
Macchi	Ni, 13 m²	Le Rhone	90/1, 250
Pomilio	P. D	Fiat A–12	260/1, 500
Ansaldo	S. V. A.–9	SPA 6–A	205/1, 600
Ansaldo	S. V. A.–2	SPA 6–A	205/1, 600
Macchi	M.–14	Le Rhone	90/1, 250

Training Seaplanes.

Zari	FBA, idro	IF V–4B	190/1, 450
Macchi	L–3, idro	IF V–4B	190/1, 450
Ansaldo	Sopwith	Le Rhone	120/1, 200

Airplanes Being Tested and Under Study.

Sia	BR	Fiat A–14	685/1, 550
Ansaldo	A–5	E–145	290/1, 650
Ansaldo	A–300	Fiat A–12bis	300/1, 600
Ansaldo	A–1bis	IF V–6	250/1, 700
Macchi	M–15	Fiat A–12bis	300/1, 600
Macchi	M–16a	Anzani Y	30
Macchi	M–16G	Gnat ABC cil. opposti	40

AIRPLANES BEING TESTED AND UNDER STUDY—Continued.

Name.	Type.	Name of engine.	Power.
Zari	Z. T.	IF V–6	250/1, 700
Vickers	M. V. T.	SPA 6–A s. s. c.	220/1, 600
Vickers	M. V. T.	SPA 62–A	300/1, 830
Ducrot	Luzzatti Stiavelli	HS–42	320/1, 800
L. A. M.	R. 6, tripl	Anzani, 6 cylinder	40
Breda	Tripl. Pensuti	Anzani Y	30
Breda	Ardea (Canard)	Anzani 6 cilindri	40
Garbardini	(a)	Gnome o	50
		Le Rhone	60
Garbardini	(b)	Anzani Y	30

SEAPLANES BEING TESTED AND UNDER STUDY.

Macchi	M–12	Ansaldo, 4 E–28	480/1, 600
Siai	S–9	Fiat A–12bis	300/1, 600
Siai	S–12	Ansaldo, 4 E–28	480/1, 600
Siai	S–13	If V–6	250/1, 700
Gallinari	M. G.–2	Ansaldo, 4 E–28	480/1, 600
I. A. M.	R–1bis	3 I. F. V–6	250/1, 700
Bastianelli	P. R. B.	4 I. F. V–6	250/1, 700

MISCELLANEOUS AVIATION NOTES—UNITED STATES NAVY.

Source: Reliable.

6 July, 1920.

Unofficial information from both the Atlantic and the Pacific Fleets, relative to the target practice, which was recently carried out, indicates that both lighter-than-air and heavier-than-air craft were employed with great success for spotting and contributed materially to the successful completion of the exercises.

Pearl Harbor.

Work of erecting the second portable canvas hangar was completed June 12. This hangar is the English Bessonean type, and was originally 79 by 66 feet. In order to accommodate two HS–2L's, this hangar was widened 10 feet and raised 3 feet 4 inches. All planes in commission are now housed in portable hangars, which are very satisfactory for their type.

Work of laying concrete slabs for second runway is now progressing. Slabs were poured on the ground and are being placed on their grade by derrick. Concrete runway was found necessary on account of very rapid deterioration of wooden runway, due to terredo.

Great Lakes, Ill.

On July 1 the Aviation Mechanics' Schools, at Great Lakes, had graduated the following ratings:

92 gunners' mates.
344 quartermasters (aviation).
217 quartermasters (dirigible).
78 carpenters' mates (aviation).
21 coppersmiths.
399 machinist mates (aviation).

JAPANESE AEROPLANE AND SUBMARINE MECHANICS TO GO ABROAD.

Source: Reliable.

(9318.)

June 3, 1920.

In the early part of May, 50 mechanics were sent from Japan to France to study aeroplane and submarine construction.

They will be in France approximately eight months, and their study will be practical as well as theoretical.

These men were selected by the navy department for their skill and mechanical ability, and are the most promising men of their trade in Japan. They are civilians, and not attached to either the army or the navy.

AVIATION.

Source: Reliable.

(13203.)

May 17, 1920.

Air Lines.

Several aerial lines are now being inaugurated by the French in north Africa from the principal seaports to interior points.

JULY 23, 1920.

Dates for completion of vessels.

BATTLESHIPS.

Delaware	Boston	Aug. 7.	Tennessee	New York	Indefinite.
Florida	do	Do.	Louisiana [2]	Philadelphia	Do.
New Jersey [1]	do	Indefinite.	Nevada	Norfolk	Aug. 7.
Virginia [1]	do	Do.	Oklahoma	do	Do.
Utah	do	Aug. 7.	Georgia [3]	Mare Island	Not set.
Arizona	New York	Do.	New Mexico	Puget Sound	Aug. 5.
North Dakota	do	Oct. 15.	Mississippi	do	Oct. 1.
Pennsylvania	do	Aug. 7.	Texas	do	Do.

[1] To be placed out of commission.
[2] To be placed out of commission Aug. 15.
[3] To be placed out of commission about July 15.

Dates for completion of vessels—Continued.

CRUISERS AND GUNBOATS.

Huntington [1]	Portsmouth	Indefinite.	Charleston	Puget Sound.	Not set.
Chester (res.)	Boston	Do.	Missoula (ex-Montana).	do	Do.
Columbia	Philadelphia	Sept. 13.	Charlotte (ex-North Carolina).	do	Do
Pueblo	do	Not set.	Seattle	do	Do.
Brooklyn	Mare Island	Indefinite.			
St. Louis	Philadelphia	Not set.			
Denver	Mare Island	Indefinite.			

DESTROYERS.

Israel (res.)	Portsmouth	Indefinite.	Biddle	Philadelphia	Sept. 1.
McKee (res.)	do	Do.	J. F. Talbot	do	Indefinite.
Ringgold (res.)	do	Do.	A. P. Upshur (fit. out).	Norfolk	Do.
Robinson (res.)	do	Do.	Balch (res.)	do	Do.
Stevens	do	Do.	Benham (res.)	do	Do.
Taylor (res.)	do	Do.	Branch (fit. out)	do	Do.
Conyngham (res.)	Boston	Do.	Clemson (res.)	do	Do.
Cowell (res.)	do	Do.	Connor (res.)	do	Do.
Foote (res)	do	Do.	Dalla (fit. out)	do	Do.
Isherwood	do	Do.	Downes (res.)	do	Do.
Kalk (res.)	do	Do.	Duncan (res.)	do	Do.
Kimberly (res.)	do	Do.	Herndon (fit. out)	do	Do.
Luce (res.)	do	Do.	Hunt (fit. out)	do	Do.
Maddox (res.)	do	Do.	Parker (res.)	do	Do.
Mahan	do	Aug. 7.	Aaron Ward	Mare Island	Do.
Meredith (res.)	do	Indefinite.	Buchanan	do	Do.
Murray	do	Aug. 7.	Evans	do	Do.
Sharkey	do	Indefinite.	Wickes	do	Do.
Abbott	New York	Do.	Woolsey	do	Do.
Ballard	do	Do.	Dent (res.)	Puget Sound	Do.
Caldwell (res.)	do	Do.	Dorsey (res.)	do	Do.
Dyer (res.)	do	Do.	Doyen	do	Do.
Gregory (res.)	do	Do.	Edwards (res.)	do	Do.
McDougal (res.)	do	Do.	Talbot (res.)	do	Do.
Morris	do	Do.	Waters (res.)	do	Do.
Sampson	do	Do.			

SUBMARINES AND SUBMARINE TENDERS.

S-3, 4	Portsmouth	Sept. 15.	K-1, 2, 3, 4, 5, 6, 7, 8	Philadelphia	Indefinite.
Rainbow	Boston	Do.	Eagle No. 17	Norfolk	Do.
Savannah	do	Indefinite.	L-3, 9	do	Do.
Eagle No. 25	Philadelphia	Do.	H-4, 6, 8, 9	Mare Island	Do.

FLEET TENDERS (train).

Cormorant	Portsmouth	Aug. 7.	Nereus	Norfolk	Indefinite.
Quail	do	Do.	Prometheus	do	Aug. 7.
Rappahannock (res.)	do	Oct. 1.	Bobolink	Charleston	Do.
Solace	do	Aug. 7.	Teal	do	Indefinite.
Brazos	Boston	Aug. 2.	Vireo	do	Aug. 7.
Bridgeport	do	Do.	Brutus	Mare Island	Aug. 15.
Bridge	New York	Aug. 7.	Comfort (ord)	do	Indefinite.
Robin	do	Indefinite.	Glacier	do	Sept. 1.
Sandpiper	Philadelphia	Aug. 7.	Jason	do	Aug. 15.
Shawmut	do	Do.	Kanawha	do	Do.
Arapaho	Norfolk	Do.	Vestal	do	Do.
Lebanon	do	Sept. 10.	Tern	do	Aug. 1.

MINE FORCE.

IN COMMISSION.

Baltimore, Mare Island, Aug. 1.

IN RESERVE.

Auk	Portsmouth	Indefinite.	Swan	Portsmouth	Indefinite.
Chewink	do	Do.	Woodcock	do	Do.
Curlew	do	Do.	Sanderling	Charleston	Completed.
Flamingo	do	Do.	Tanager	do	Indefinite.
Grebe	do	Do.	Turkey	do	Do.
Lark	do	Aug. 7.	Whippoorwill	do	Do.
Mallard	do	Do.	Widgeon	do	Do.
Osprey	do	Indefinite.	Pigeon	Mare Island	Do.

[1] To be placed out of commission.

Dates for completion of vessels—Continued.

MISCELLANEOUS.

Paducah	Portsmouth	Oct. 15.	Nokomis	New York	Indefinite.
Patuxent	do	Indefinite.	Hannibal (res)	Philadelphia	Dec. 15.
Aramis	New York	Do.	Conestoga	Norfolk	Indefinite.

N. O. T. S.

Henderson	Philadelphia	Oct. 2.	Nero	Charleston	July 24.
Caesar	Norfolk	Indefinite.	Bath	Puget Sound	July 31.

EAGLE BOATS.

Eagles Nos. 6, 7, 8, 10, 12, 35, 38, 47, Portsmouth, indefinite.

Eagles Nos. 34 and 58, Portsmouth, completed.

Eagle No. 57, Puget Sound, indefinite.

JULY 9, 1920.

OTHER GOVERNMENT DEPARTMENTS.

U. S. ARMY.

General Schofield	Portsmouth	Indefinite.	New Orleans	New Orleans	Indefinite.
Donovan	New Orleans	Do.			

U. S. SHIPPING BOARD.

Otsego	Portsmouth	Indefinite.	Lake Deval	New York	Indefinite.
Peacock	do	Do.	Warbler	Philadelphia	Do.
Black Arrow	Boston	Do.	Willet	do	Do.
Geo. Washington	do	July 30.	Comstock	New Orleans	Do.
Agamemnon	New York	Indefinite.	Orion	do	Do.
Chautauqua	do	Do.			

BATTLESHIPS OUT OF COMMISSION.

Coast B. S. No. 1 [4]	Philadelphia.	Maine [4]	Philadelphia.
Coast B. S. No. 2 [4]	Do.	Missouri [4]	Do.
Coast B. S. No. 4 [4]	Do.	Rhode Island [4]	Mare Island.
Alabama [4]	Do.	Vermont [4]	Do.
Illinois [4]	Do.	Wisconsin [4]	Philadelphia.
Kearsarge [4]	Do.	Nebraska [4]	Mare Island.
Kentucky [4]	Do.		

BATTLESHIPS UNDER REDUCED COMMISSION.

Louisiana,[1] Philadelphia.

CRUISERS, GUNBOATS, AND MISCELLANEOUS OUT OF COMMISSION.

Dubuque [5]	Portsmouth.	Tallahassee	Charleston.
Paducah [5]	Do.	Topeka	Do.
Isabel	Philadelphia.	Monadnock [6]	Olongapo.
Ozark [4]	Do.	Castine [6]	New Orleans.
Tonopah [4]	Do.	Cincinnati [6]	Do.
Yankton [6]	Do.	Petrel [6]	Do.
Jupiter [7]	Norfolk.	Wheeling	Do.
Standish [6]	Do.	Bay Ocean [6]	Mare Island.
Wasp [6]	Do.	Machias [6]	Do.
Winchester [6]	Do.	Marblehead [4]	Do.
Nashville [4]	Charleston.	Supply	Do.
Raleigh [6]	Do.	Yorktown [6]	Do.

TORPEDO BOATS OUT OF COMMISSION.

CTB No. 1 (Foote) [4 6]	Philadelphia.	CTB No. 9 (Somers [4 6]	Philadelphia.
CTB No. 2 (Rodgers) [4 6]	Do.	CTB No. 11 (Barney) [4 6]	Do.
CTB No. 3 (Dupont) [4 6]	Do.	CTB No. 12 (Biddle) [4 6]	Do.
CTB No. 4 (Dahlgren) [4 6]	Do.	CTB No. 14 (De Long) [4 6]	Do.
CTB No. 6 (Morris) [4]	Newport.	CTB No. 16 (Thornton) [4 6]	Norfolk.

[1] To be placed out of commission.
[4] No work being done.
[5] General repairs.
[6] To be sold.
[7] Conversion into aeroplane carrier.

Dates for completion of vessels—Continued.

EAGLE BOATS IN ORDINARY.

AT PORTSMOUTH

Eagle No. 1.	Eagle No. 23.[8]	Eagle No. 41.	Eagle No. 52.
Eagle No. 2.	Eagle No. 24.	Eagle No. 42.	Eagle No. 54.[8]
Eagle No. 3	Eagle No. 26.	Eagle No. 44.	Eagle No. 55.
Eagle No. 5.	Eagle No. 27.	Eagle No. 45.	Eagle No. 56.[8]
Eagle No. 9.	Eagle No. 28.	Eagle No. 46.[8]	Eagle No. 59.
Eagle No. 13.	Eagle No. 29.	Eagle No. 48.	
Eagle No. 18.	Eagle No. 36.	Eagle No. 50.	
Eagle No. 19.	Eagle No. 37.	Eagle No. 51.	

SUBMARINES OUT OF COMMISSION.

U–117 [9]	Philadelphia.	UB–88 [9]	San Pedro.
U–140 [9]	Do.	U–111 [9]	Portsmouth.
UB–148 [9]	Do.	A–2, 4, 6, 7 [6]	Cavite.
G–1 [10]	Do.	B–2 [6]	Do.
UC–97 [9]	Chicago.		

SUBMARINES AND SUBMARINE TENDERS IN RESERVE.

D–1, 2, 3 [11]	New London.	K–1, 2, 3, 4, 5, 6, 7, and 8 [12]	Philadelphia.
Eagle No. 33	Do.	E–1 and 2	Hampton Roads.
Fulton	Do.	Eagle No. 17	Do.
G–3 [11]	Do.	L–1, 2, 3, 4, 9, 10, 11, M–1	Do.
N–1, 2, 3, 4, 5, 6, 7 [11]	Do.	F–2, 3 [13]	San Pedro.
Eagle No. 25	Philadelphia.		

SUBMARINES IN ORDINARY.

A–3, 5 [4]	Cavite, P. I.	B–3 [4]	Cavite, P. I.

VESSELS TO BE PLACED OUT OF COMMISSION IN NEAR FUTURE.

Warbler	Philadelphia.	Quiros [6]	Asiatic Station.
Elcano [6]	Asiatic Station.	Samar [6]	Do.
Pampanga [6]	Do.	Villalobos [6]	Do.

REDUCED COMMISSION OR ORDINARY.

Rappahannock [5]	Portsmouth.	Hannibal [5]	Philadelphia.
Chester [5]	Boston.	Comfort [5]	Mare Island.
Caesar [5]	Norfolk.		

DESTROYERS OUT OF COMMISSION.

AT PHILADELPHIA.

Ammen.	Jarvis.	Patterson.	Trippe.
Beale.	Jenkins.	Paulding.	Walke.
Burrows.	Jouett.	Perkins.	Warrington.
Drayton.	Mayrant.	Roe.	
Fanning.	McCall.	Sterrett.	
Henley.	Monaghan.	Terry.	

OLD DESTROYERS OUT OF COMMISSION AND BEING SOLD.

AT PHILADELPHIA.

Hopkins. Smith.

[4] No work being done.
[5] General repairs.
[6] To be sold.
[8] In full commission.
[9] Being dismantled.
[10] Target for depth charge experiments.
[11] S/M school, experimental and development work.
[12] Under repairs.
[13] Elemental S/M school work.

Summary by navy yards of ships under repair.

PORTSMOUTH, N. H.

Huntington	Indefinite.
Israel (res)	Do.
McKee (res)	Do.
Ringgold (res)	Do.
Robinson (res)	Do.
Stevens	Do.
Taylor (res)	Do.
S–3, 4	Sept. 15.
Cormorant	Aug. 7.
Quail	Do.
Rappahannock (res)	Oct. 1.
Solace	Aug. 7.
Auk (res)	Indefinite.
Chewink (res)	Do.
Curlew (res)	Do.
Flamingo (res)	Do.
Grebe (res)	Do.
Lark (res)	Aug. 7.
Mallard (res)	Do.
Osprey (res)	Indefinite.
Swan (res)	Do.
Woodcock (res)	Do.
Paducah	Oct. 15.
Patuxent	Indefinite.
Eagles Nos. 6, 7, 8, 10, 12, 35, 38, 47	Do.
Eagles Nos. 34 and 58	Complete.
General Schofield	Indefinite.
Otsego	Do.
Peacock	Do.

BOSTON.

Delaware	Aug. 7.
Florida	Do.
New Jersey	Indefinite.
Utah	Aug. 7.
Virginia	Indefinite.
Chester (res)	Do.
Conyngham (res)	Do.
Cowell (res)	Do.
Foote (res)	Do.
Isherwood	Do.
Kalk (res)	Do.
Kimberly (res)	Do.
Luce (res)	Do.
Maddox (res)	Do.
Mahan	Aug. 7.
Meredith (res)	Indefinite.
Murray	Aug. 7.
Sharkey	Indefinite.
Railbow	Sept. 15.
Savannah	Indefinite.
Brazos	Aug. 2.
Bridgeport	Do.
Black Arrow	Indefinite.
George Washington	July 30.

NEW YORK.

Arizona	Aug. 7.
North Dakota	Oct. 15.
Pennsylvania	Aug. 7.
Tennessee	Indefinite.
Abbott	Do.
Ballard	Do.
Caldwell (res)	Do.
Dyer (res)	Do.
Gregory (res)	Do.
McDougal (res)	Do.
Morris	Do.
Sampson (res)	Do.
Bridge	Aug. 7.
Robin (res)	Indefinite.
Aramis	Do.
Nokomis	Do.
Agamemnon	Do.
Chatauqua	Do.
Lake Deval	Do.

PHILADELPHIA.

Louisiana	Indefinite.
Columbia	Sept. 13.
Pueblo	Not set.
St. Louis	Do.
J. F. Talbot	Indefinite.
Biddle	Sept. 1.
K–1, 2, 3, 4, 5, 6, 7, 8	Indefinite.
Eagle No. 25	Do.
Sandpiper	Aug. 7.
Shawmut	Do.
Hannibal (res)	Dec. 15.
Henderson	Oct. 2.
Warbler	Indefinite.
Willet	Do.
Iowa	July 31.

NORFOLK.

Nevada	Aug. 7.
Oklahoma	Do.
Abel P. Upshur (fitting out)	Indefinite.
Balch (res)	Do.
Benham (res)	Do.
Branch (fitting out)	Do.
Connor (res)	Do.
Clemson (res)	Do.
Dallas (fitting out)	Do.
Downes (res)	Do.
Duncan (res)	Do.
Herndon (fitting out)	Do.
Hunt (fitting out)	Do.
Parker (res)	Do.
Eagle No. 17	Do.
L–3, 9	Do.
Arapaho	Aug. 7.
Lebanon	Sept. 10.
Nereus	Indefinite.
Prometheus	Aug. 7.
Conestoga	Indefinite.
Caesar	Do.

CHARLESTON.

Bobolink	Aug. 7.
Teal	Indefinite.
Vireo	Aug. 7.
Sanderling (res)	Complete.
Tanager (res)	Indefinite.
Turkey (res)	Do.
Whippoorwill (res)	Do.
Widgeon (res)	Do.
Nero	July 24.

NEW ORLEANS

Donovan	Indefinite.
New Orleans	Do.
Comstock	Do.
Orion	Do.

MARE ISLAND.

Georgia	Not set.
Brooklyn	Indefinite.
Denver	Do.
Aaron Ward	Do.
Evans	Do.
Wickes	Do.
Woolsey	Do.
H–4, 6, 8, 9	Do.
Brutus	Do.
Comfort (ord)	Do.
Glacier	Sept. 1.
Jason	Aug. 15.
Kanawha	Do.
Vestal	Do.
Tern	Aug. 1.
Baltimore	Do.
Pigeon (res)	Indefinite.

Summary by navy yards of ships under repair—Continued.

PUGET SOUND.		PUGET SOUND—continued.	
New Mexico	Aug. 5.	Dorsey (res)	Indefinite.
Mississippi	Oct. 1.	Doyen	Do.
Texas	Do.	Edwards (res)	Do.
Charleston	Not set.	Talbot (res)	Do.
Missoula	Do.	Waters (res)	Do.
Charlotte	Do.	Bath	July 31.
Seattle	Do.	Eagle No. 57	Indefinite.
Dent (res)	Indefinite.		

OFFICE OF NAVAL INTELLIGENCE.
NAVY DEPARTMENT.
Washington, D. C.

MONTHLY INFORMATION BULLETIN.

NUMBER 9—1920.

15 SEPTEMBER, 1920.

DISTRIBUTION:

In general: Bureaus of the Navy Department; all force commanders; all commanding officers of capital ships, the larger patrols, destroyers, submarines, and Navy transports.

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MONTHLY INFORMATION BULLETIN.

NUMBER 9—1920—15 September, 1920.

FOR CONVENIENCE IN ROUTING.

Officer.	Initials.	Date received.	Date forwarded.
Captain			
Executive Officer			
First Lieutenant			
Navigating Officer			
Gunnery Officer			
Communication Officer			
Engineer Officer			
Medical Officer			
Supply Officer			
First Division Officer			
Second Division Officer			
Third Division Officer			
Fourth Division Officer			
Fifth Division Officer			
Marine Officer			

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OPERATIONS.

RECOMMENDATIONS REGARDING NAVAL PRACTICES IN TIME OF WAR.

Source: Captain T. T. Craven, U. S. N.

20 March, 1920.

The supreme influences of business and of industrialism in war, generally not mentioned in historical narratives, and therefore not brought to the attention of military and naval men, supplies details which are of great interest.

When the United States entered the war, the conflict had been carried on for nearly three years, and affairs in Europe had adjusted themselves to the business in hand. It would seem that an appreciation of this fact was not generally prevalent in America, and certainly it was not clear to naval and military officers. As a hint of how deeply industrialism had penetrated into military affairs in France, the information was illuminating that a French "ace", upon successfully bringing down an enemy opponent, received a thousand francs from the maker of the machine which he was flying at the time, and another thousand francs from the builder of the engine which he was employing. It seemed that everywhere, in every detail, the war had been made a matter of business.

In the establishment of the bases for naval aviation along the coast, it became evident to the writer that the lack of experience of the United States in these matters was taken advantage of by certain contractors and politicians as well as others who were keenly looking out for and furthering their own business interests during the course of the struggle, and were at that time even anticipating the close of hostilities. The important thing oftentimes seemed to be to encourage the United States to spend money, and to inculcate in our minds that, by spending in Europe, we would accomplish much more than could be done in other ways toward sustaining the allied cause. In the days following our entrance into the war it may have been considered abroad that in military operations the effort of the United States would not amount to a great deal, and hence the thought that through the expenditure of hard cash we could best assist the common cause.

Having in mind the fact that war is simply the continuation of governmental policy, in which arms replace diplomacy as the agent

for furthering the aims of the Government, we see that war, a business supreme in importance and magnitude for the countries engaged in the struggle, is in a sense an elaboration of the activities of peace, directed and intensified in new lines when hostilities are begun.

The business side of war is beyond the ken of the military or naval man, as it is something with which, in time of peace, he can have but little to do to compare with the everyday experiences of those occupied in business as a livelihood. The shrewd, unscrupulous, far-sighted individual always is given opportunities for exploitation and for the improper employment of money in the establishment or expansion of all big industries created in emergencies, such as confront a nation plunged into conflict. As an example, we have the giving of wages many times the pay allowed those sent to the front to those engaged industrially and who were not drafted. This can not be condoned, except on the ground of lack of appreciation of what such a procedure would entail then and later upon the taxpayer.

Previous to engaging in a war, the industrial and business ou look should be seriously considered. This would seem to be a matter of the greatest importance when espousing an allied cause. It may be that the United States will never again have to repeat the experiences of the last years of the war just terminated, but if such should again become necessary, it would seem that the first forces sent to the theater of operations and to the countries with which we were to become allied, should be representatives of large business interests with broad legal and business training, and of stanch and well-established integrity. It should be the duty of these individuals to look to the future and to pass upon the industrial enterprises to be created in alien territory. The legal representatives sent abroad at this time should build up the simple and, at the same time, considerable organization necessary in caring for the claims and legal entanglements sure to arise during the occupation of foreign soil. Business men should scan the contracts entered into, and investigate all business enterprises which may be urged upon the United States. It is needless to state that great financial sacrifices are necessary in the furtherance of the destructive business of war, and the machinery created for the purposes of economy should not be so cumbersome as to delay or to obstruct operations, and all should be entirely subject to the wishes of the commander in chief.

Upon the return to this country after the cessation of hostilities, one could not fail to be amazed at the stupendous scale, with which production had been carried on and the lavish way in which money had been expended, not only in the creation of industrial plants but also of centers, from many of which it had been anticipated that active operations would be conducted. Of course, the expenditure

of effort, money, and man power necessary to create these establishments had an enormous moral influence, and the building up of these establishments by the United States in our own country as well as abroad undoubtedly in itself had an influence upon the termination of the war. It is a platitude to state that it is of vital importance that in war constant effort should be directed toward intensifying activity in the theater of operations. Military activities should be principally in regions where the enemy is to be met. They should be forced there, and minimized in other localities where they make for extravagance and a dispersion of effort.

An important feature in the administration of any great business is to coordinate and to balance the requirements of operations with those of personnel and of materials. In time of war, this is a most difficult matter to handle. Materials must be supplied in abundance, and one can not anticipate precisely, requirements in so far as these are concerned. Wide changes in the plans of operations may be compelled at any time by the actions of the enemy. Nevertheless, somewhere in the oganization, not far behind the front, must there be continuous effort to coordinate these three factors, as otherwise there may be interference in plans and a great wastage of effort and of money, which, if hostilities are unduly prolonged, may have a very adverse influence.

Transportation.

A detail of the business of war of tremendous importance is that of transportation. During the recent conflict, this problem was one of gigantic magnitude. In war, a final solution of the problem of transportation is found only in the delivery of personnel or materials at their ultimate destinations at the proper time, and in a condition permitting their employment. Everything that has to do with transportation in territories over which military operations are being conducted, is filled with complications. All problems involving the handling of tremendous amounts of materials are made terrifically complex by the movement of immense bodies of men through the same ports and over the same lines of communication as those utilized for the handling of materials. It is not enough, as was borne out by the experiences of 1898 and more recently, to collect materials, in vast quantities and to ship them to the neighborhood in which they are to be utilized. In addition, they must be received and distributed in order to be useful.

The following is quoted from the report of the board investigating the supply, shipment, and general condition of naval aircraft materials, dated November 13, 1918:

"(*f*) Building materials have generally not been shipped in the most logical sequence, roofing materials being in some cases shipped in advance of columns and roof supports; ships' cargoes have been

badly mixed up with regard to classes of materials carried; in some cases stores for two or more destinations have been mixed up in one hold; in some cases stores consigned to one destination have been unloaded at another without due consideration having been given to the practical impossibility of transporting these stores expeditiously to their final destination. This latter condition has not only added considerably to the difficulties of construction and operation, due to the fact that it has been exceedingly difficult to obtain necessary transportation from one port to another, but has resulted in the loss of considerable quantities of stores which have never reached their final destination. The loss of such stores possibly accounts for the nondelivery of certain items which records presented to the board indicate as having been shipped from the United States but as never having reached their final destinations.

"(*g*) Seaplanes for assembly in Queenstown, Ireland, have in some instances been delivered in Glasgow, Scotland; seaplanes for assembly in Pauillac, France, and airplanes for assembly in Eastleigh, England, have been delivered in Brest, France. In practice Pauillac has been found to be too far from a number of the French operating stations to serve as an efficient assembly, repair, and supply base for them, and considerable unanticipated difficulty has resulted from this fact. For various military reasons it was found necessary from time to time to divert from their appointed destinations ships carrying aeronautical cargo. The necessity of transporting this cargo from its unexpected destination to its real destination has presented much difficulty.

* * * * * * *

"(*i*) * * * Deliveries of structural materials at Pauillac were not completed until several months after the dates on which they were expected, and delays in the completion of buildings were occasioned thereby.

* * * * * * *

"(*l*) Enormous quantities of caustic soda have been shipped to Pauillac, and in several cases this caustic soda has been mixed with the cargo without crating the drums. In some other cases the drums have been crated, but the caustic soda has formed a part of the general cargo. In practically every instance in which the caustic soda has formed a part of the general cargo, drums of this soda have burst and on some ships portions of the cargo have been destroyed, and the unloading of the cargo, as well as of the caustic soda itself, has been made more difficult and hazardous. Where drums have been crated, breakage has been small, but it is considered that caustic soda in insubstantial drums, whether crated or uncrated, should not form a portion of the general cargo unless placed in the bottom of the hold.

"(*m*) Attention is invited to the fact that the conditions regarding shipments of stores referred to above have now been very largely corrected and the objectionable features of the shipping procedures have been eliminated. This indicates to the board that a proper consideration of these matters at first might have resulted in an avoidance of some of the difficulties encountered. It appears possible that, when shipments were first started, it was the practice to load stores into a ship in the sequence in which received without enough consideration being given to the nature of the cargo, to the destination of the cargo, or to the immediate needs abroad, with the idea of getting the cargo started toward its destination as soon as possible. The result of this practice, if such a practice was responsible for the conditions reported on, has been to cause delay of ships and of personnel considerably greater than would have been experienced if ships had been held for the proper assembling, loading, and routing of cargoes.

"(*n*) Much inconvenience has been occasioned upon unloading a number of vessels by the absence of or incomplete condition of the manifests, shipping lists, cargo lists, etc. So far as the board is informed, bills of lading have always been included with cargoes, and in a number of cases cargo lists and other papers as well have been included. It seems certain, however, that in some cases when ships have touched at more than one port, these papers have been removed before the final destination was reached, and at such final destination there have been received no records of the cargo or of the contents of individual cases. In some instances shipping papers, even when included with cargoes, have not been furnished the department concerned in time for use in unloading. During the earlier shipments it was frequently the case that insufficient marking was placed on cases and that, as a result, insufficient information regarding the contents of these cases was contained in shipping lists. However, both as regards shipping papers, as well as the marking of shipping cases, experience has led to improvement, and the present situation is such as to present few difficulties.

"(*o*) Due partly to inadequacy of storage facilities, partly to that of personnel and partly to that of railroad trackage and handling facilities, the first cargoes unloaded in Pauillac were dumped with insufficient regard for the contents of the packages and, in many cases, with insufficient protection, about the grounds of that station. The board ascertained that, up to a comparatively short time prior to their visit to this station, masses of uncatalogued stores were piled up around the grounds of this station. The board appreciates the fact that the conditions existing at this station, above commented upon, and the necessity experienced for unloading

vessels as rapidly as possible, made some portion of this confusion unavoidable.

"(*p*) It appears to the board that the supply department at Pauillac and the supply departments of other assembly bases, as well as those of operating stations, have been much handicapped by the inexperience of the officer personnel supplied for these stations. It appears to the board, in the absence of definite knowledge of the circumstances, that it should have been practicable to obtain in the United States men for such duties at these stations of more complete training and experience.

* * * * * * *

"(*r*) The shipment of planes and of power plants in incomplete states has seriously interfered with operations. * * * Had complete seaplane shipments been made with all of the plane and power plant accessories included in one group of packing cases for each plane, the assembly problems of the bases would have been greatly simplified, and operations would, undoubtedly, have been expedited.

* * * * * * *

"(*aa*) Until some time in August no handling trucks for HS–1 seaplanes had been received in Pauillac. * * * In the absence, however, of any definite knowledge of the circumstances, the board is of the opinion that these handling trucks could have been supplied from the United States in time to make unnecessary their construction by the operating stations and assembly bases.

"(*bb*) There have been a number of engine shortages. In the absence of any definite knowledge as to the circumstances attending the shipment of these engines, the board is unable to understand why they should not have been completely checked and shortages supplied before shipment. Though these engines were supplied by the United States Army, it would appear to the board that an effective supervision could have been exercised over the question of shortages, and that no such list of shortages should have existed upon shipment. The investigation of this matter by the department concerned is recommended.

"(*cc*) It is impossible for the board to definitely estimate the delay in operation resulting from these engine shortages, and they can state only of the hand starter shortage that it has occasioned actual delay in operations. The board is not in possession of full data concerning the question of the supply of hand starters and is, therefore, unacquainted with the circumstances attending this supply, but it appears that only nine were received at Pauillac from American sources prior to August 20.

"(*gg*) The packing of the engines, where these engines have not been subjected to unduly rough handling or have not been exposed for too long a time to particularly bad weather conditions, has met

all requirements. The packing of propellers, however, and of planes, has not, in a number of instances, been substantial enough, and considerable injuries necessitating repairs at assembly bases have resulted. The board considers that this is a question which should be met by the exercise of extreme care in connection with future packing of overseas shipment, and by the adoption of the sturdiest possible types of packing cases with careful interior arrangements to prevent the injury of contents.

"The board has given careful consideration to the question of recommendations for improvements. With the exception, however, of recommendations bearing on slight changes in procedure, below stated, the board has no recommendations to make as such incidents of delay or of possible oversight above commented upon, are in no cases due to fundamental faults of the organizations concerned, but to a temporary failure of some one of these parts to function in an entirely satisfactory manner.

"1. It is recommended that in all cases in which bureaus prepare requisitions, or other forms of purchase authority, for materials for aeronautical operating stations or for repair bases, copies of these papers be immediately forwarded, to these stations, and that they be kept informed periodically regarding the status of each paper.

"2. It is recommended that information regarding desirable or necessary changes in aircraft be communicated to all the stations affected as promptly as possible and in as great detail as practicable, and that where such changes involve considerable material requirements, some method be developed for automatically providing for the material needed in connection therewith.

"3. It is recommended that, as far as may be practicable, all planes intended for export for foreign service be completely assembled before being boxed for shipment."

Many of the difficulties incident to the transportation overseas of aviation equipment have been set forth above. The importance of marking packages legibly and properly, however, is not stated. It is understood that the wonderful system devised for the collection and shipment of materials in the United States, as finally perfected, has been fully reported on. It is believed that it would be advantageous to study this report in connection with reports regarding experiences abroad relative to the receipt of materials. It is believed that an investigation of this nature would be fruitful in developing and completing a study of this tremendously interesting and most important problem.

In the location of a base of any kind "transportation" is a factor of almost paramount importance. Its importance was not always appreciated during this war and the station at Pauillac was an example of a supply base incorrectly placed.

Standardization of Weapons.

The importance of having ammunition and weapons of standard type was impressed during the war. As an example, it was expected in the American air stations on the French coast that American bombs would be available and would be used. The American bombs were of a different size and shape from those used by the Allies, and required their own bomb gears. Consequently, when the American bombs arrived and were found not to be efficient, it became necessary to fall back upon our allies for a supply of both bombs and carriers. The importance of having standardized ammunition and weapons has been enhanced because of the numbers of weapons employed in combat areas and the amount of ammunition expended.

Attention is invited to the paragraph quoted below from the report of the board investigating the supply, shipment, and general conditions of naval aircraft materials, dated November 13, 1918:

"(*ee*) Of United States bomb gears, bomb sights, and bombs, very few have as yet been placed in operation. The first bomb-dropping gears, 14 sets in all, were received on July 26 and 27. Since that date sufficient bomb-dropping gears for all purposes have been received. From American sources only one bomb-dropping sight had been supplied by September 1; however, arrangements had been made as early as December 19, 1917, presumably at the suggestion of the Navy Department, to purchase 100 of these sights in England. Considerable difficulty has been experienced in obtaining sufficient of these sights in England within the time required, only 25 having been received to date at Pauillac. All American bombs received before September 30 were defective and have been returned to the United States. This has made necessary the modification of bomb-carrying gears in order to take French bombs and the securing of French bombs for use. Definite interferences with offensive operations have resulted from these shortages."

Handling Men.

The increase of the aviation force of the Navy from a personnel consisting of 38 officers and 163 enlisted men in April, 1917, to 6,917 officers and 43,452 enlisted men at the time of the armistice, was indeed a remarkable feat, for, while expanding in a fashion almost inconceivable, training in a new art was carried on and at the same time the active operations of war were being conducted. That this was possible without confusion must have been due to the fact that a splendid organization, elastic and pliant, existed in the Navy itself. The handling of men and the creation of organization permitting the wielding of man power are perhaps the most important and at the same time the most difficult of all tasks.

It is believed, in looking back upon early years of service in the Navy, that the attention of young officers is not sufficiently drawn

always to the importance of the art of handling subordinates. One skilled in this art can always and certainly acccomplish great tasks, whereas one unskilled is doomed to failure before his effort is begun. For an officer there is no other professional subject to equal it in importance. The first and most important lessons are acquired at the Naval Academy and on the summer practice cruises, where the midshipmen have before them definite examples of conduct, bearing, and quality on the part of officers. Is the importance of assigning officers best fitted for the work of instructing those on whom the future of the Navy depends appreciated in making assignments to the Naval Academy? It is there that the first principles of morale—getting the best out of men—are imparted.

Coastal Aviation.

The following notes on coastal avaition as applied chiefly to the suppression of the submarine are submitted:

District Aviation Aid.

There will be in the office of each commandant of a naval district an aid who will be charged, under the commandant, with the administration of all aviation matters pertaining to the district.

His duties will include collecting and distributing to the air stations in the district all information that would be of value in the operation of aircraft, determining the best general methods of operation to accomplish desired results, assisting the commandant in the execution of activities involving the use of aircraft, determining the extent to which the air activities of the district are fulfilling requirements, and the requiring of such reports from air stations and other sources as will provide thorough knowledge of all air activities for the information of the commandant and of the Navy Department.

Intelligence Officer on Station.

The intelligence officer will be an aid for operations, strategy, and confidential information. He will be a line officer, and should be especially trained, and when possible he should be a pilot or ex-pilot disqualified for reasons not to his discredit. His duties will be:

(*a*) Keeping track of enemies' movements.

(*b*) Keeping track of movements of own forces.

(*c*) Care of confidential books.

(*d*) Care of communications, including radio, telephone, telegraph, and pigeons.

(*e*) Cognizance of photography.

(*f*) Cognizance of reports of operations.

(*g*) Cognizance of meteorology.

(*h*) Liaison.

General Rules of Operating.

The commandant of the naval district will lay down the definite areas which the air stations in his district will patrol, modifying them from time to time as may be considered advisable. It must be understood that the borders of these areas are not impassable, and in case it should be desirable to do so, that one must not hesitate to go beyond them. In cases where aircraft enter other naval districts reports required by the commandant will also be made to the commandant of that other naval district covering operations in his district.

In cases where the service of a station is temporarily too busy to accomplish all operations desired, the district commandant will be notified. He will in case of doubt designate the most important operations, and if desirable endeavor to obtain assistance from another air station or another naval district.

Except within a limit of 5 miles of a station, or in case of emergency, seaplanes will not patrol singly. A single seaplane will not continue a patrol if it becomes separated from formation, on account of weather or on account of the others becoming disabled, except in an "emergency or S. O. S." or "convoy" patrol.

Aircraft will carry their full ordnance equipment except in special cases when such action would militate against the successful accomplishment of their mission. When encountering a submarine, bombs from all aircraft should be launched successfully. It is inadvisable to keep any on the chance of again meeting the submarine.

The usual height for patrol should be between 600 and 800 feet, reducing altitude with low visibility. The usual height for bombing is about 300 feet.

All orders given in advance or from a distance necessarily involve an imperfect knowledge of three principal factors in aviation:

(*a*) The local weather conditions.

(*b*) The condition of material.

(*c*) The condition of personnel.

The principle will govern, therefore, that the commanding officer of a station will always be sole judge of the possibilities of execution. All orders that are transmitted will impliedly contain the following reservation: " f you consider it possible, and not highly inadvisable."

Rôle of Aerial Patrols.

Patrols by aircraft must provide, in order of importance:

(*a*) Convoy patrol.

(*b*) Emergency or S. O. S. patrol.

(*c*) Reconnaissance patrol.

(*a*) *Convoy patrol.*—This service consists in insuring protection of convoys to and from the farthest practicable limits from the shore. Necessary information will be furnished by the district commandant

the day previous. When a convoy is to pass from one naval district to the next, the commandant concerned will give such information as may be necessary to the commandant of the next district in order that uninterrupted service may be obtained.

No very definite rules or diagram can be laid out for convoy work; the important thing is to keep the convoy constantly in sight and to be in touch of it. If the convoy is to start at night, the land and adjacent zones should be patrolled just before dark. In order to have seaplanes constantly with a convoy it is of course necessary to run frequent relays. These can be so arranged as to enable adjacent stations to cooperate.

A patrol carried out in an oval-shaped area would seem advisable for this work. The center of the oval should shift ahead fast enough to allow the rear edge of the oval to cut the last of the convoy. This would insure the thorough sweeping of all the waters ahead of the convoy on both sides and would prevent a submarine from attempting to get in from astern. Roughly speaking, the seaplane should not go more than 5 miles from the convoy. The distance, of course, depending upon visibility. The glare of the sun should be watched carefully when searching for submarines. Lighter-than-air craft should have regard for the wind.

Care must be taken in operating with convoys not to pass directly over any ship. When the escort is ended, the aircraft should return to the station making reconnaissance, and that information must always be indicated in their orders before they start.

(*b*) *Emergency patrol.*—This service consists in sending immediately two or more seaplanes to the point where an enemy submarine has been sighted or a ship attacked. This action may be ordered by higher authority or may be initiated by the station upon receipt of information from any source. For the purpose of the emergency patrol, whatever the number of seaplanes in commission, at least two will always be held in readiness to start flights immediately.

Upon the departure of the emergency patrol, arrangements will be made for the dispatch of all remaining aircraft available for which important missions, as the escort of a convoy, for example, have not been ordered. These additional aircraft will be sent out as circumstances dictate to be best, either all together or successively, to reenforce or relieve the emergency patrol first dispatched, the details of operation being dependent not only on the number of aircraft in commission but also on the number of hours of daylight left. It is only possible to give this instruction: Try to insure uninterrupted patrol of the suspected zone as long as possible.

(*c*) *Reconnaissance patrol.*—This service consists, when those of the emergency and convoy are assured, of sending aircraft to patrol areas assigned the station in order to discover hostile craft. This service

may be carried out as a routine daily patrol required by higher authority, or may be ordered specially by district commandant, or initiated by the station, or for the purpose of obtaining information concerning the situation in the areas assigned the station.

Search Methods.

The secret of any antisubmarine patrol lies in the element of surprise. Ability to shift and vary the direction of patrol is therefore of cardinal importance, but careful distinction must be made between hit-or-miss patrols run in a haphazard manner and a carefully worked out system which does not depend upon the mere hope of luck. In other words, success in patrolling depends upon a conscientious study of submarine reports; foresight in figuring out the areas where the submarines may be expected; and upon a systematic patrol of the zones in question.

Because of the above factors a patrol should be laid out so that there will be frequent change of direction, but in such manner that a well-defined and accurate course will be followed.

Any area, regardless of the size or shape, may be so laid out that the combination of such courses when properly plotted will thoroughly cover the ground. When any one patrol diagram is decided upon for a particular patrol it should be followed as accurately as possible. With the use of a drift indicator, the matter of keeping a course is a comparatively simple matter; that of obtaining ground speed and hence the time to make changes of course requires considerable practice for any degree of accuracy. It may be found at some stations that the velocity and direction of the wind throughout the area patrolled is normally the same as that registered at the station; in such cases time schedules of course changes can be worked out in advance. It is necessary, however, that the pilot navigating be continuously on the watch for changes in either wind force or direction, and be prepared to alter his time schedule accordingly.

Discovery and Attack of Submarines.

Patrols must be carried out with an intelligent understanding of the methods employed by submarines. The submarine when not afraid of attack prefers to run on the surface to enable her to see any possible target at a greater distance and at the same time to keep batteries fully charged. If patrols are active in the vicinity or the submarine wishes to operate in sight of the coast, she will remain submerged, showing the periscope from time to time. When patrolling on the surface by day, she will probably have a little of the upper deck showing and will steam slowly. In this condition ("awash") she can submerge in from 12 to 30 seconds. When making a passage she uses her engines and can attain a speed of 18 knots or over. When submerged the speed will usually be slow, as high speed quickly exhausts batteries. Speeds as high as 10 knots

can be made by modern submarines. At very slow speeds endurance may be as much as 60 hours or more.

Submarines take every opportunity of recharging batteries, and if submerged during the day, come to the surface as soon as the coast is clear after dark. When charging they invariably keep under way, using one motor as a dynamo and the other for propulsion. The presence of aircraft, although they may not be able to see the submarine, will very much limit the area in which a submarine can be dangerous to shipping. When attacking submerged, submarines must show their periscopes for a short time at intervals to enable them to attain correct position for attack. The periscopes must also be shown when the torpedo is fired.

As a rule submarines will see aircraft operating in the vicinity and will submerge before the aircraft sights the submarine. In case a submarine is sighted on the surface it is, therefore, probable that she has not yet seen the aircraft on account of clouds, low visibility, or because of the aircraft and the sun being on approximately the same bearing from the submarine. In such cases it may be possible to maneuver closer to the submarine without being sighted; the important thing is to get to the submarine as quickly as possible.

In principle, one will consider as an enemy every submarine submerged and every submarine on the surface which is not convoyed by a friendly ship, or which does not make the correct recognition signal.

It is necessary to watch carefully all wakes even of short extent, for they often arise from the motion of the periscope. In good weather, when a submarine is traveling at attacking depth, the eddies made by its screws reach the surface and form a wake, sometimes very visible and well characterized, the head of which is behind a submarine from 60 to 100 yards.

When the submarine comes to the point of increasing its submersion rapidly, the wake stops with a final eddy very strong and behind, as is said above, the real position of the submarine.

When a submarine is sighted the nearest seaplane should lead the attack. In case of two or more seaplanes heading for a submarine that has been sighted simultaneously and equally distant, the rules of the road will apply to avoid the possibility of collision, the seaplane that has the right of way leading the attack.

Immediately after heading for the submarine the pilot takes his bombing altitude at full throttle. The observer makes his last adjustments preparatory to dropping the bombs, then picks out the submarine or its swirl and guides the pilot by means of the pilot director or by motions. Meanwhile, the recognition signal is prepared by the member of the crew whose duty it is. This is fired when about

2 miles distant. A second one is made if possible. It is the observer's duty to see whether or not these are answered.

One of the crew whose services can be spared mans the stern hatch or doors with a camera.

An attempt should not be made to get into the wind or to go over the submarine in a fore and aft direction, unless there is plenty of time.

If a wake only has been sighted, the bombs should be launched from 60 to 100 yards ahead of it, or about two or three seconds after the line of sight has passed over the wake.

In case the submarine is seen to submerge, the time should be taken, and approximately 10 feet advance per second be allowed. Therefore, if there is no wake observed, the bombs should be dropped ahead of the swirl made by submerging, according to the time elapsed to get over the spot.

It has been estimated that within one minute after the conning tower disappears the enemy could be going at right angles. The submarine could also be on any turn less than 90°. The figure giving the possible courses it might have taken is, therefore, fan-shaped, the base of the fan being the spot where the submarine went down. Bombs must be dropped, then, in lines covering the possible maneuvers of the submarine, remembering that for each second's delay the submarine is in a new arc 10 feet farther away from the disappearing point.

Let us suppose there are three machines on patrol duty. A submarine is sighted and attacked; it submerges and 45 seconds afterwards the formation swings over it. The leader at the apex of the triangle drops his bombs so as to cover the path if the sub went straight ahead, and aims some 400 feet ahead of the swirl, bracketing his bombs. The machine on the right drops its bombs on its line to the right of the leader so as to cover the submarine if it turned to the right. The seaplane on the left takes care of its side. It is apparent, therefore, that the fan-shaped area has been well covered with bombs and the destructive areas should include the submarine no matter how it turned.

Immediately after such action, or when sighting a submarine all trace of which has disappeared before arrival of the aircraft, the location and pertinent details will be sent by radio, or in default of that by carrier pigeons, and always by verbal report made upon the return to the station.

Reports.

In addition to the routine reports required in peace times, the following additional reports shall be made during hostilities.

Daily report at 8 p. m. by dispatch or telephone to Navy Department and district commandant of aircraft (*a*) available for patrol the following day, (*b*) out of commission.

Daily charts, showing operations, by mail the same day to Navy Department and district commandant.

Reports of all movements of aircraft to and from station, by telephone, to district commandant. (Does not include local flights for testing, etc.)

A report should be made to stations concerned, daily by the district commandant, of the location of any friendly craft that will operate in the station patrol area or adjacent areas the following day.

The following notes were written by a British officer during the war with Germany for airship patrolling, but the information in most cases applies equally to heavier-than-air craft.

GENERAL OBSERVATIONS—THE CHARACTERISTICS AND HABITS OF SUBMARINES—THE QUESTION OF OIL DETECTION—EXAMINATION OF SUBMARINE EXERCISES—TORPEDO ATTACK AS VIEWED FROM THE AIR.

Of the greatest value and interest are the typical examples of the submarine's modus operandi—what he does when attacked, etc. This is the reverse view to ours, and it is essential that we should be conversant with it, so as to be in a position more successfully to attack the submarine.

It must be continually borne in mind that although the work is one of the most interesting duties of the war, it is at the same time one of the most difficult, and that the great success—i. e., destroying a submarine—only comes to that officer who is content to spend countless hours efficiently working his patrol and waiting his chance. It is of the utmost importance that the junior pilot should realize to what a very great extent success depends on paying attention to detail. It is rather a mistake to have a too optimistic view of the work at the commencements, and each pilot should realize that he has a most difficult job in front of him. Submarine hunting is a serious sport in which the fish are very wary, and not at all keen to rise to the fly. Great patience must be displayed, and a constant and continual watch kept.

As captain of the patrol airship, it is the business of the pilot to keep his crew interested in the work, and to pay the greatest respect to what they sight and report, not to discourage them by hasty denunciation, as crews have been treated for pointing out as a submarine a trawler or a whale. Where possible everything should be investigated, for what one may think is no more than one of the numerous harmless barrels or a flock of seagulls may well turn out, on closer investigation, to be either a mine or periscope.

Perhaps it is best to deal only generally with the convoy work, and in this to realize that although at present the mere fact of an airship acting as escort is sufficient to safeguard the convoy, this may not

always hold. The airship must always be in the most central position to resist attack. Thus if the wind be westerly, position should be taken to the west, or windward of the convoy, hovering over if necessary the most westerly ship, even if the convoy's course be east, and not ahead as might at first seem to be the proper position.

This may seem obvious, but ships have been lost through the aircraft escort being well to leeward, when an intelligent and daring enemy submarine observing this has attacked with success. Owing to the aircraft's position down wind, it has taken the aircraft considerable and very valuable time to reach the enemy's position, which could be seen from the torpedo tracks. On arrival all definite trace has disappeared. Were the aircraft in a position up wind, attack could be made at a moment's notice. The submarine, by his periscope, is watching unobserved, and if he sees aircraft with a convoy and that aircraft up wind there is small chance of his attacking. If he does he stands a considerable risk of being destroyed.

In order to make this point quite clear to the novice, when the wind is 30 knots west and the airship speed is 50 knots, if the airship has to attack up wind, her speed is 50 knots minus 30 knots, 20 knots, or 9 minutes to cover 3 miles. When attacking down wind, however, her speed is 50 knots plus 30 knots, 80 knots, or 2 minutes to cover 3 miles. At the first sign of the torpedo being fired, the airship can therefore attack, and using depth charges and knowing the position of submarine from the end of torpedo track, should have a reasonable chance of success. With large convoys the more airships, of course, the better, but where only one is employed she should fly as indicated above. With two, one can be over or behind and one in front searching the track. Care should be taken not to neglect the main work, i. e., the safety of the convoy, in taking photographs, etc.

The Characteristics and Habits of Submarines.

It is hardly necessary to describe a submarine, but viewed from the air at about 1,000 feet and say 5 miles away, it is not easy to pick up. What generally gives away the position of the craft is the foam from his conning tower if traveling at any speed. Roughly and briefly, submarines are from 150 to 300 feet long. The enemy coastal type (150 feet) is single hulled, and if a bomb explodes near the hull it has a good chance of sinking the ship. Submarines are transversely compartmented off by bulkheads, the central or control department under the conning tower being the most vital. If this compartment is holed, it means the boat is sunk. The fore-and-aft compartment can be holed, but if the bulkhead doors are closed, the submarine could still come to the surface with part of her crew alive if sufficient buoyance remained.

A submarine has hydroplanes and rudder in a manner similar to the airship and dives by the use of the planes under way. The

ballast tanks of a submarine are analogous to ballonets in a nonrigid, except that they are used for trimming and depth instead of pressure and height.

They are spaced somewhat after the airship fashion, and can be controlled separately; in operation the water is blown out by compressed air for rising, and let in through sluice valves for diving. The German submarine's speed is 15 to 18 knots on the surface and up to 9 knots submerged; the latter speed rarely used unless it is essential to get quickly away from an area, or to get into position for attack. When running submerged, batteries only are used, and the duration at full speed—i. e., 9 knots for 1½ hours to 2 hours—is equivalent to 15 miles. The general practice, however, is to proceed underneath at 1 to 1½ knots, the maximum radius at this speed being 70 knots. This distance, however, can only be accomplished on fully charged batteries, and although it is the ideal practice to keep these fully charged, it is not always possible. Therefore, it can be taken as a fact that though a submarine can proceed, say, 70 knots under water without recharging, it is highly improbable that she will do so without frequently using her periscope to see whether it is possible to continue on the surface. It is, of course, not the practice for submarines to sink vertically by filling their ballast tanks; they always dive by means of their hydroplanes. In shallow water—i. e., in the neighborhood of 20 fathoms or so—submarines lie on the bottom and regular billets are known to them, which they frequent. Such billets if known to the searching party should be salted, i. e., mined for the visiting submarine, and quite a few have been disposed of in this manner.

A modern boat can lie at about 150 to 200 feet and one of our own submarines was the other day depth charged at 200 feet, the explosion forcing him to 300 feet where luckily he struck bottom. The pressure blew the blister tank, straining the plates, but luckily the submarine escaped damage. Merchant captains who have been captured and conveyed to Germany by submarines report that when the boat has been attacked on passage it has often dived to such depths that the plates began to bulge and creak, and the joints to leak.

Then, when bombed, they say that another bomb or depth charge, or two together instead of the first single shot, would often have been fatal. This is a point of extreme value to bear in mind in attack. When sighted a submarine usually dives to 60 to 100 feet and proceeds slowly under her battery power away from the locality of sighting. If on the surface with ballast tanks fully blown, the engine is first shut off and the batteries switched on, the boat being rapidly trimmed down by the tanks. Usually in hostile waters the submarine is, or should be, in a trimmed-down position proceeding

with decks awash, ready for immediate diving, which can be done in less than three-quarters of a minute. The coning tower swirl remains in evidence for about a minute, but there is no evidence of swirl from the propeller. The whole mass of the submarine being moved through the water naturally causes a disturbance, seen in muddy waters by eddies of mud.

Goggles fitted with color films which have been tried in home waters have not been very successful, and it is thought that what is needed is a series of careful experiments with an airship sitting over a submarine, when useful and serviceable data should be obtained. Air bubbles from exhausted tanks, and the trapped air about a submarine, only show for a matter of a second in diving.

In the numerous cases in which submarines have been successfully attacked it is because they have not submerged quickly enough; so that it could be laid down as an axiom that a careful submarine commander who makes no mistakes has little chance of being detected by aircraft. It is possible, and is a constant practice, for submarines to watch aircraft without fear of detection, and this has been proved by numerous records. The ordinary periscope is 2 to 3 inches in diameter and if the boat proceeds at 1 to 2 knots 20 feet deep, with about a foot of periscope showing, there is no foam left by the periscope, simply oil-like water. In calm weather this is very difficult to pick up, even when one knows where to look, and practically impossible otherwise.

Experienced and successful officers from the leading active-service seaplane and airship stations, discussing the question periscopes, have agreed that on each of their stations there had been only one authentic case of a periscope having been sighted, and that possibly there was doubt even of that. This is out of a total of 61 submarines sighted for two stations, and gives the beginner a fair idea of the futility of wasting his time concentrating on a search for an object the expert will only see by remotest chance. The usual distance of signting an enemy submarine is from 4 to 5 miles, although in clear weather they have been seen as far off as 10 miles.

One station reports having seen a total of 24 awash and 20 fully blown, and this is about a fair average. What has often been mistaken for a periscope is the conning tower of a submarine running awash. From a distance of 3 to 4 miles off this is only a speck and leaves a long line of foam. The best practice, of course, for a submarine is to travel fully blown (in unprotected areas), and a submarine commander proceeding in this fashion trusts to getting down quickly enough on sighting aircraft. This has on occasions been one of his mistakes, for though in clear weather the vessel is invisible to aircraft for some time after he has spotted the aircraft, a reckless or daring submarine commander may be caught risking too much.

It may be generally known tnat a submarine is painted dull grey on the vertical plane, i. e., where visible from one side at a distance, and black on the horizontal plane where visible from above. In addition to making the submarine very difficult to see on the surface, due to its colors blending with those of the sea mass, this coloration also serves the purpose of making the craft less visible in clear water. Were the submarine all grey, to escape the surface detection, the grey would show up as a light green under the water. On the other hand, if the submarine were all black it would show more clearly on the surface. The above combination is therefore made, in which the submarine is protected from horizontal observation by her grey paint and from vertical and underwater detection by the black.

Submarines frequently adopt disguises in order to escape detection, or to enable them to approach more closely to their victims. Isolated fishing vessels and trawlers should always be approached with suspicion. Submarines fitted with sails have dived with full disguise in position. It is quite possible that some of the larger submarines will be fitted out as dummy tramp vessels.

A submarine never floats, i. e., never stops his motors under water (experiments show that this can not be done for more than from 5 to 7 minutes) unless he finds he is chased by hydrophone flotillas, etc., and he then restarts his motors immediately on hearing the watching craft under way. The matter is best impressed on airship officers when they understand that the ballasting of a submarine is much more difficult than that of an airship, and in one extreme case, through different currents, and, therefore, density changes, resulted in the boat's buoyance altering 26 tons. There is a remote chance, therefore, that a submarine commander, being chased and believing that he had sufficient negative buoyancy, or encountering different density through tide, might momentarily appear on the surface by mistake on switching off his motors.

In some cases aircraft have passed submarines on the surface, and there is an instance of one of our submarines recently coming to the surface—it was not fitted with a skyscraper periscope, and everything seemed clear through the ordinary one—and finding, as the commander described it, "the sky filled with Zeppelin." So close was the airship that he could see the faces of the men in the gondola. Fortunately they were keeping a lookout horizontally, and he quickly closed his conning tower and dived, hearing nothing more.

This is one of the chances for which one must be on the lookout and it is here that aircraft's opportunity comes in. One of our airships patrolling on a misty day sighted a submarine rising to the surface a quarter of a mile on her beam. The airship swung round to attack, and got over the submarine just as it was diving, the

submarine commander having by then spotted her and discovered his mistake. He had evidently looked round with his periscope and not seeing the airship in the mist concluded that all was clear. This is another probable chance for airship patrol. It is by taking advantage of climatic conditions that aircraft gets its best chances. Such advantages are found when flying in a fog, flying in and out of low clouds, and in flying with a convoy and being in a position against the sun when the submarine is sighted.

The hunt is constantly resembling an ordinary sport such as fishing. Just as one has to change one's flies for different rivers and times of year, so one has to alter one's methods and look for and adopt different plans of operation, and schemes of detection for different areas. For instance, in clear waters such as the Mediterranean and Baltic, submarines can be seen at 60 to 80 feet depths; in the western approaches to the Channel one has been seen at 30 feet, while in the muddy waters up Channel, and off Harwich, it is impossible to see a submarine under the surface even with periscope well out. Then in the Queenstown area captains of the submarines report that the manner in which sea gulls follow their periscopes in the Atlantic is very noticeable, far more so than in the North Sea, where it seldom occurs. This information is very valuable for our patrols in locating submarines, as one might neglect to examine a spot around which sea gulls were congregating, or if one happened to notice the momentary wash of a periscope, it might be mistaken for the usual shoals of fish with sea gulls overhead, one is constantly seeing. It is interesting to note that one of our airships on the east coast reported that she had bombed a periscope which sea gulls were following.

Submarine searching is still of the nature of research work, and everyone engaged on it should make careful notes of every encounter or attack he is fortunate enough to witness. In the immediate and intelligent application of one's knowledge only can advantage be taken of the chances offered, and it is necessary to remember that these chances occur chiefly because the enemy has made a mistake, or is careless. Other occasions offer themselves when circumstances out of his control give the submarine away, and a good example of an involuntary exposure to attack is attached:

4 p. m. Seaplane sighted. Submarine submerged.

6.40 p. m. While submerged in billet submarine broke surface owing to temporary defect in fore hydroplane motor. Four minutes later bomb dropped from seaplane.

Another submarine commander remained at his diving station during one patrol, without sighting anything. His interned ballast tanks commenced to leak into the battery cells so he came to the surface, returning to his base. One of the dangers submarines are

open to is the fact that sulphuric acid of the batteries in contact with salt water generates chlorine—a very deadly gas. In this case the submarine was forced to return on the surface, and would have been an easy mark. This feature is worth consideration, for if aircraft only partially damage the enemy, but as a result of the damage chlorine is produced, it is then only a matter of time before the submarine must come to the surface. The advantage, therefore, of airships remaining over the site of an attack is evident. Involuntary exposure to attack might occur in rough weather, and in short steep seas, when no rest, for instance, could be obtained in a billet chosen before the wind changed. In moving to a fresh billet the submarine might expose itself to attack, and this is to be looked for. In some seas lying on the bottom is impossible, and even with considerable negative buoyancy the vessels roll and bump at 20 to 30 fathoms, bumping vertically 20 to 30 feet. This is likely to open up seams, and perhaps cause oil leakage.

The Question of Oil Detection.

In the early days, airships' antisubmarine reports were often ridiculed because pilots persisted in stating that they had seen traces of oil or oil tracks, and it therefore becomes important to set down clearly what exactly does appear and what is meant by an oil track, so that our more junior officers will know what to look for. An airship, when she sees a suspicious movement, line, or patch, can stop dead over the spot and, remaining stationary, nose into the wind, can make the most accurate examination possible. On the ordinary patrols numerous patches and broad and narrow lines of oil caused by surface craft are seen, and although one casually examines them all there is not the time to investigate each carefully. When, however, one sees definite oil patches, and on closer examination thin lines leading away from them, in an area out of traffic lines and perhaps coincident with a spot an enemy submarine has been signaling from or reported in shortly before, one's deduction would be weak if the two were not connected. A careful analysis, therefore, of the evidence that has been gained by experience will be useful.

The sources of oil from a submarine are many and one might say that theoretically there should be no trace once she has dived. When running on the surface she will leave oil from her exhaust similarly to any gas-engined surface craft, but a submarine's shaft has special lignum vitae bushings, and the exhausts are automatically sealed at the outside on diving, so that every precaution is taken to prevent any leakage of oil whatsoever when submerged. Practically, however, when a submarine running on the surface sights aircraft, it dives as rapidly as possible; and it is the case that every submarine the writer has seen dive, enemy or friendly, has always left a patch of oil and that a thin trace of oil always follows the direction

taken. The oil clinging to the upper works of the submarine and to the exhausts, from imperfect combustion, always remains as a patch. There is also a certain amount of oil from the hydroplane bearings, periscope, etc., quite sufficient to leave the trace spoken of. This trace of oil is not a broad lane but in some cases so indefinite that it requires one's utmost vigilance to follow. Of four British submarines specially examined from the air, all showed these oil traces clearly—in the case of *J–7* continuously, and of *F–1*, *C–21*, *E–58*, intermittently.

An interesting case is that reported by an airship patrolling about 100 miles southwest of the Scillys. An enemy submarine had been reported there and the airship was sweeping in the vicinity, when a patch of oil was sighted some miles away and closed with for examination. As she was proceeding upwind, a thin line was noticed leading away from the patch and as it was reached was clearly seen to make a right-angle turn altering course from west to south. A flare was dropped to gauge speed and a heavy depth charge dropped ahead of the oil track. Unfortunately, owing to the distance from station and bad weather between the ship and her base, she had to be recalled after spending only a short time waiting for symptoms. Some oil had come up after the explosion, but later in the day and near to the area a trawler successfully rammed a damaged submarine on the surface, so that it is evident the attack was partially successful and led to the final destruction of the submarine. What evidently had happened is that the submarine on the surface heard the airship's engines and, sighting her patrolling in and out of the low fog banks, dived hurriedly and altered his course.

Some types of submarine, if away from their base for some time, use their oil tanks for ballast, i. e., after using a certain amount of heavy oil, salt water is taken in its place. Owing to the difference in viscosity, specific gravity, etc., the oil and water do not mix, but in diving, oil would be carried out by the exuded air, and so swell the traces of oil that are referred to. Another possible source of oil is that submarines proceeding on patrol may bump into floating wreckage, etc., and be slightly damaged, though not sufficiently to cause a return to base. Sometimes they may have grounded heavily. In these accidents strains are bound to be set up, and a slight leakage of oil may result, of which they know nothing. A case is referred to later of *E–18* being followed for the best part of a day, although she did not come to the surface once and was out of sight at 80 to 100 feet after the first bombing.

Examination of Submarine Exercises.

J–7 was witnessed doing trials in Whitsand Bay, off Plymouth. The water was clear in the area. The submarine on diving left a small patch of oil, and was clearly visible for over a minute after

the periscope had disappeared owing to the vessel being painted gray, appearing a vivid green to a depth of about 30 feet. All sight of the craft was then lost, but a faint trace of oil was noticed in line with the small smooth patch which it left on diving. This track was most difficult to pick up and was only followed because the airship could remain stationary over the spot and follow very carefully. Had she been going at any speed, it would have been lost at once and not picked up again. A quarter of an hour afterwards the light-green form of the submarine was sighted directly underneath, and a minute afterwards broke surface, two miles away from the point of submerging. This test proves conclusively that given favorable circumstances, and knowing where a submarine has submerged, an airship can follow its course underneath the surface when all sight of the craft has gone.

F–1 was witnessed at war practice exercises in Sandown Bay, and details of one attack are as follows:

9.55. *F–1* on course southwest dived.

A faint oil track was left on surface which disappeared. Submarine was easily followed by its periscope, which was just showing, and by the disturbance of the muddy water. On the commencement of the dive with hull underneath a faint green form could be seen. Nothing of the hull was visible with periscope almost submerged.

10.04. *F–1* altered course to south-southwest. Decided track left in muddy water on turning.

10.20. Torpedo boat destroyer *DC–4* approached from east at full speed.

10.25. When slightly ahead and about 800 yards from torpedo boat, *F–1* fired torpedo.

Just before this and subsequent firings, bubbles of air and a small upheaval of water were seen about half a minute before actual firing of torpedo, this probably due to opening of torpedo tube.

The moment of firing the torpedo could be clearly seen and the whole track was clearly marked by a line of air bubbles.

Torpedo boat destroyer saw torpedo coming, altered course, and so avoided being struck.

In the subsequent exercises the submarine which had come to the surface after each attack, always left a small patch of oil in diving, and intermittent traces when running completely submerged.

Captains of airships, in addition to keeping and seeing that a good lookout exists, should realize that endurance and patience in watching an area are great factors of success. Several cases have occurred in which an airship, by waiting for periods between 5 and 10 hours over areas where submarines have been reported has finally had an opportunity to attack. An example that may be of value

is an occasion when, during patrol, an airship sighted at 5 a. m. a vessel that had been torpedoed 15 minutes before.

Tugs and the usual antisubmarine surface craft were wirelessed for, and the airship, realizing that the enemy submarine could not be far away, started circling at full speed in an endeavor to detect any evidence that still remained. This was continued for six hours without trace being seen, when the submarine was suddenly sighted 5 miles astern. The conning tower was awash and the craft was on a course that would bring it ahead of the torpedoed vessel, the intention evidently being to have another shot when the airship left. The submarine was down wind from the airship, but right in the path of the sun, and the commander, evidently having a little knowledge, concluded the airship would not see him. He made his mistake on that point, as he did not realize that the airship's envelope acted as a sunshade. Heavy bombs were dropped on the vessel as it submerged, and much oil and air came to the surface. An investigating destroyer found several square miles of oil, and a strong oily smell, and sweeping trawlers fished up a plate. This is an instance of the patience exhibited being rewarded; but many ships have patrolled for long hours with no visible results, very probably because a submarine has not made a mistake, though the airship has done most valuable work of a negative nature. Clearly the submarine's plan is to keep out of sight when aircraft are about and this is generally done.

Torpedo Attack as Viewed from the Air.

A brief nontechnical word on torpedoes and evidence of torpedo when fired from submarines may not be out of place. There are two general types of torpedo—the cold and the hot. Owing to its construction the air in the latter type is heated, and on expansion in the engine less is used than in the cold type. This air contracts on reaching the exhaust, and still further on reaching the sea, so that only a small amount of air bubbles leaves the torpedo, and hardly any track is visible. This track could not be seen from a distance.

The reverse is the case in the cold type, and a very much greater quantity of air is used, causing quite a distinct track to be left, which can be clearly seen from the air. At least one enemy submarine owes its destruction to this fact. In this instance an airship noticed a large explosion and column of water shoot up alongside a large steamer—one of a group of seven—some 6 to 7 miles astern and down wind. Presumably the submarine must have seen the airship, but concluded that as she was on a course away from him, and as the wind was rising, he was safe from attack. The airship, however, did sight the attack and proceeded to the spot with a wind of about 40 miles per hour, attaining 90 to 96 miles per hour. The torpedo

track was clearly seen on nearer approach, and then the form of the submarine became discernible when over the end of the track as a light-green form slowly proceeding westward. The airship bombed this mark with effect, much air and oil coming to the surface, and trawlers called up dropped several depth charges a few minutes afterwards, when much more air and oil came to the surface. This can be put down also as a case where the submarine itself laid open to attack through a mistake, the commander probably concluding that as the airship was on a course away from him he would not be seen in attack. Incidentally, it shows the importance of keeping a remarkably good lookout in all directions, principally astern, where, as in this case, action is least expected.

THE SUBMARINE POINT OF VIEW—SUBMARINE ENCOUNTERS WITH AIRCRAFT—MINE-LAYER SUBMARINES—SUBMARINE VERSUS SUBMARINE—METHOD OF ATTACK BY AIRCRAFT.

The Submarine Point of View.

Now the opposite point of view, as held by submarine officers, is not widely known in the airship service, and it would seem rather important to know what they think and feel. The reason a submarine commander respects aircraft is because his position is given away if he is seen, and the purpose of his patrol is interrupted.

Naturally, surface craft are at once brought on the scene, and later, if airships work with very fast coastal motor boats fitted with hydrophones (and an adaptation would be C. M. B.'s that were in addition rigged with a sail), the submarine's chances would be less, as even from aircraft of the fastest type he has not much to fear if he keeps a proper lookout. Pilots must always realize this and to try and catch him unawares. The German submarine commander's object is to conceal his position, which, if known, means his being harried and also that he loses his chance of a convoy, whose course is altered. Cases will be certain to occur later where, of two submarines working in conjunction, one will show itself so that the other may have greater freedom of action elsewhere. Apropos of submarines not wishing to be seen, and relative to the efficiency of aircraft in a certain area, our submarine antisubmarine patrol report mournfully:

"It is now very seldom that a German submarine is seen on the surface, and it is obvious that the activities of aircraft and our submarines have compelled hostile submarines to take greater precautions, and to remain constantly submerged during daylight hours." This is the experience of all patrol areas nowadays, and it is of note that practically all the sinkings of merchant vessels take place at night.

Perhaps the best way to get a realistic idea of what an enemy submarine commander does will be to imagine him as he leaves his base, say, Bruges. There are two routes at present to his main hunting grounds, and we will consider the southerly, via the Straits of Dover. He has a nerve-racking time, as first of all he has to pass through our antisubmarine barrage and mine fields, aircraft, submarines, and all manner of surface craft and devices that are used to prevent if possible his passage, which is usually made at night.

When he gets through this he has run his batteries down considerably, and therefore has to risk running on the surface as much as possible to recharge. This is an additional danger, and is the chance for aircraft, as it is probably daylight at this stage of the proceedings. Each attack, even if unsuccessful, has some effect on the submarine's crew, and by the time the vessel gets to the open sea and reaches its patrol area their judgment and efficiency may be considerably affected. A case is given later, illustrating this point of view, from an actual attack on a submarine. Patrolling up and down waiting for a target, a submarine may often get into position for torpedoing, only to be put off by the vessel altering course, etc., at the psychological moment. Submarines do not worry about surface craft, and often approach them quite closely on the surface or diving, with their periscope. Our own submarine commanders have crept so close to German vessels that they could see the faces of the men cleaning the guns quite distinctly. Merchant skippers who have been prisoners in German submarines confirm this, but state that when aircraft of any description is seen there is an immediate panic on board, and all possible speed is made to submerge.

Considering the actual attack, if the victim is unaccompanied, the submarine usually keeps his periscope up after the attack to get the name of the vessel, etc. With other surface craft about he is more wary and dives at once, but he is not at all afraid of getting in between an escort and convoy. A German submarine has actually retorpedoed an escorted cruiser that was surrounded by destroyers. In the latter case the submarine was finally sunk, but in other similar cases daring submarine commanders have added the escort as well to their bag. If aircraft arrive, the submarine will dive at once to 60 to 100 feet, and proceed slowly away at, say, 1½ to 2 knots. If surface craft as well, with hydrophones, are being used, he will intermittently stop his engines (but only for a few minutes), lying still when everything is quiet and starting up again on hearing engines being run. It is rarely that a submarine proceeds under water (9 knots) after attack.

A feature now occurs that is perhaps novel to some people, and that is that the general practice of the submarine commander is to come to the surface, say a half to an hour after he has been seen,

has attacked, or has been attacked, either to satisfy his curiosity or to see whether he can proceed. The sound and safe thing to do is to remain underneath for a much longer period, but this rarely happens, and again this is where aircraft gets a chance it would not otherwise have. After he has his look subsequently to the attack, if there is danger the submarine goes down again, coming up an hour afterwards, apparently repeating this with increased periods under water (depending on the personal equation) till the coast is clear. Naturally he is keen to get on with his work, but it appears very hazardous to come up and risk finding destroyers or aircraft right on top of him, and be shaken to pieces—in some cases sunk—when a little patience would have rendered him immune. At the risk of being redundant, it is emphasized that a very useful period to arrive on the scene is shortly after the torpedoing. When the submarine is discovered his position is not enviable. Actual data from the captain of the submarine giving a recent continued attack is appended and the psychological effect on the crew is given, showing that in this case, where the attack failed, the moral results achieved were considerable, so much so as to stop the submarine's work for some time:

8.37. Dived to avoid attack.

8.40. Loud explosion of depth charge aft. First lieutenant and men lifted off feet and stern vibrated very violently. Another violent explosion.

8.50. Took bottom in 23 fathoms, and stopped all motors.

9.05. Loud explosion. Most violent of all. All lights out. Thought we were hit.

All the explosions were very loud and violent, shaking the boat considerably; the last believed to be sweep explosive as a wire was heard grating on the hull just before explosion. The after-hydroplane jammed, and the compass took on a permanent deviation of 5°. There was no permanent moral effect on the crew, but highly strung individuals were effected for some time. There was a feeling of impotency at being unable to hit back. For two or three days men started when touched.

The captain affirms that one's judgment would most likely be affected for several days after such an occurrence—inducing either overcautiousness or rashness. In this case it is evident that had the depth charges been of the type now being used, the submarine would have been destroyed.

Submarine Encounters with Aircraft.

Owing to the annoyance Zeppelins were causing our submarines, and the extent to which their patrols were interfering with our work, some of our boats were specially armed in the early days of the war, and two of them with 6-pounders apiece, were sent out on an expedi-

tion primarily to engage the airships. The following is a short description of one of the encounters:

7 a. m. Near Vyl Light. Seaplane sighted.

10.20 a. m. Near Horns Reef. Seaplane sighted.

10.30 a. m. Near Horns Reef, Zeppelin (large, 5 cars) sighted. Height about 2,000 feet. Approached to 2,000 yards and then turned away as if unwilling to attack. Fire opened with all four guns. Airship at once rose to 6,000 feet steering toward boat, down wind and with sun behind. Firing was continued till airship was inside gun angle of 75°. Submarine then submerged. Three bombs dropped shortly afterwards.

In this case Zeppelin apparently maneuvered for position up wind and sun and attacked when in this favorable position.

Only small surface bombs were then in use. The other submarine also had an encounter and sighted a Zeppelin, opening fire when the latter was 3,000 yards off and 2,000 feet high. The first shot was believed to be a hit, as the Zeppelin dropped by the nose, righted herself, turning short on her tail, and steering away to 7,000 yards, where she remained. The boat dived as assistance was coming up, and had periodical peeps during the day, sighting Zeppelins and seaplanes, but not being attacked.

Illustrative of a submarine being followed and attacked by an airship when the submarine imagined she was invisible is the following case:

The submarine had previously attempted an attack on a large steamer, but grounded in 4½ fathoms. In the light of our experience now, it is probable that a slight strain occurred and that oil was leaking slightly somewhere. However, the details are that the submarine continuing her patrol (Nordeney Gat) sighted a Zeppelin close inshore, and dived to 20 feet, at 9.30 a. m.—i. e., she continued to patrol with periscope just showing. At 11.50 a. m. she dived to 60 feet, presumably because the airship was approaching, and as it is obvious to us now that one can not sight the periscope from a distance and height unless by absolute luck it is clear that something else attracted the airship's attention. The sequence of events points to the airship sighting a line of oil, as for some time nothing happened. Twenty-five minutes later, however, a bomb exploded astern. It seems clear that as the airship waited 25 minutes with the submarine at 60 feet before dropping her bomb, she must have dropped it at the head of an oil track, allowing therefore for the time the oil would take to rise from 60 feet to the surface, this would account for the explosion astern. It is clearly impossible that she saw the submarine, otherwise all the bombs would have been unloaded at once.

This is an interesting case from an airship captain's point of view as several have had practical experiences of this kind. The Zep-

pelin commander apparently examined the movement below, took 25 minutes to decide that it came from a submarine, and then dropped his bomb. At 12.50 he dropped two more bombs, which the submarine reports exploded moderately close. The latter therefore dived to 80 feet and altered course northwest at 1 and 1¼ knots What serves to prove definitely that he was leaving a track of oil i. that at 3.10 p. m., nearly three hours later, and when the submarine had been at 80 feet all that time, three more bombs were dropped, one being right above him. The submarine in this case got clear, as the bombs were of light weight and were surface ones. The commander himself states that he was at a loss to discover why he was being followed and attacked when out of sight at 60 to 80 feet, and in spite of the sea being ruffled, with a slight swell on.

After this attack (and it is of value to see how the personal equation must be considered) the commander of this boat specially mentions in his report that he did not lie at the billet for which he was making, because he had been sighted near there, but proceeded elsewhere.

All evidence goes to show that submarines never lie at the bottom near areas in which they have been sighted, and this of course is common sense.

The above case is distinctly analogous to one that happened some 20 miles southeast of Plymouth, in which an airship sighted a faint line of oil, and on closer examination found disturbance of the water resembling the disturbance from propellers of a deep-seated steamer. This track was followed until it became quite certain that a submarine was below, and a flare was dropped to ascertain, if possible, the speed. Patrol trawlers were summoned, and bombs and depth charges dropped together, some 300 feet ahead of the track.

The oil track was similar to one the airship had a week previously witnessed when examining trials of submarine *J–7*, but as the water was muddier, the commotion mentioned above was also seen. Disturbance of an exactly similar nature was also seen when working with *E–58* off Harwich, and this was noticed by the five submarine officers on the airship. After the explosion the forward motion of the line definitely stopped, and a thin line about 100 feet across, made up of numerous light oil bubbles that could be distinctly seen, formed diagonally across the previous direction of motion. This formed a considerable patch, and more depth charges were dropped. A large destroyer and some hydrophone drifters sat over the spot, which was buoyed, and in the morning heard noises as of an engine being started and stopped. More depth charges were dropped, and a very large amount of oil came up. It would have been of the utmost value in this case could a diver have been

sent down, as it is most important to prove beyond all doubt that an airship can so follow a submarine. Records prove that Zeppelins have often followed our submarines when they have been under the surface and out of sight. It must not, however, be thought that it is contended this is possible in all circumstances. On the contrary, it is only in special cases, as a submarine proceeding at no great depth in muddy water, carelessness, or damage, leaving oil traces, and other suspicious signs, that this type of clue can be followed. Were the captain of an airship carefully trained and experienced from actual contact with submarines in his own particular patrol area, it would seem apparent that more cases of successful attack would occur. Coordination of all forces is the ideal in submarine hunting, and it is therefore the duty of every airship captain to familiarize himself with all surface craft in his area, so that when the time for united action does arrive he knows their methods, signalling, etc., are at concert pitch, and everything works smoothly.

A case of general interest illustrating the futility of examining a patch of oil and dropping bombs on it without having a definite line to drop ahead of, is the following:

4.36 p. m. Sighted seaplane, 3 miles southeast. Dived to 80 feet.

4.39 p. m. Three bombs dropped overhead, followed by three more bombs, and then three more.

4.44 p. m. Three bombs dropped.

5.30 p. m. Rose to surface to man gun, nothing being seen of seaplane. Before gun is ready, seaplane is sighted overhead, of a different type to first. Dived. Three bombs dropped before boat got under. Two more at 60 feet. Course shaped north, slow speed.

6.10 p. m. Seaplane again sighted coming up to attack. Fire opened at 3,000 yards. Plane shearing off and keeping 3 miles astern of boat. Intention had been to keep on surface till dark.

7.30 p. m. Seaplane lost sight of.

8.30 p. m. Dived, altering course to south. Plane again seen 2 to 3 miles off. Submarine dived to 80 feet, heading east-southeast.

9.15 p. m. Nine distant explosions heard in quick succession. Remained down till dark.

This encounter took place close to the German coast, the seaplanes evidently returning for more bombs. In the first attack 12 bombs in all were dropped, and were evidently of light surface type. The nine distant explosions at 9.15 p. m. were evidently dropped on the patch of oil the submarine left on diving at 8.30. He had been running on the surface for some time, and would have certainly accumulated some oil from his engines. By altering course 16 points he helped to nonplus the seaplane.

Mine-Layer Submarines.

These, in addition to mine laying, are also used for attacking merchant vessels, and carry torpedoes, some carrying a gun.

Mine laying is usually done at night, and a rough general description follows. The mine layer is the ordinary patrol submarine, but has a series of cylindrical chambers along her sides inside the stream line, and capable of holding the mines. The mines are self-contained, and are released by dropping them through the bottom of their containers, i. e., the bottom of the submarine. For about a quarter of an hour—but this depends altogether on the type of mine being dropped—they have a negative buoyancy, and sink to the bottom, complete with sinker, mooring gear, etc. The action of the water releases the gear when desired, and the mine floats to the desired height above its anchor, being then ready for action. A general impression of mine-laying conditions can be gathered from the following account of one of our mine layers, and it is remarked that the operation was carried out at a period when there were no dark hours in the area.

5.27 p. m. Dived to avoid two seaplanes 2 miles off.

6.35 p. m. Rose to surface. Several fishing boats in sight. Weather unfavorable for mining operations, sea being dead calm, and atmosphere heavy and moist, causing smoke from exhaust to remain on surface.

6.45 p. m. Fishing smack appeared out of fog bank, and let go dan buoy one-fourth mile away. Seaplane appeared from northwest, 2 miles away. Submarine dived to bottom, 57 feet, flooding all tanks. Four explosions heard. A few minutes later started pump to lighten submarine. Three more explosions heard, so everything stopped.

7 p. m. Engines of trawlers heard on hydrophones.

7.10 p. m. Heavy explosions heard—believed dropped near dan buoy, which was probably used to make submarine's position.

8.40 p. m. Rose to 40 feet, and kept under till 10.10 p. m., owing to there being no dark hours.

11.30 p. m. Mines laid.

Perhaps this case illustrates better than any the vital importance of keeping over a spot where an attack has been made until there is no doubt whatever that the submarine is destroyed—either by ocular signs or absolute proof, or that it must have escaped during the original attack. If necessary a constant watch with aircraft, hydrophones, sailing sweeps, etc., should be kept for two days.

In the above case the submarine could not have escaped had the hydrophone trawlers, and presumably hydrophone sailing vessels (the fishing vessels sighted), remained on the spot. They evidently concluded nothing could have lived under their attack, so departed to report another English submarine sunk. Too much stress can not be laid on the great necessity for exercising extreme patience and endurance. Antisubmarine hunting calls for these qualities, coupled with keenness of the highest degree.

Submarine Versus Submarine.

This is a class of work that is a great anxiety to all the other anti-submarine patrols. Unfortunately several of the submarines so employed have been sunk by our own forces, and although their crews are quite prepared to take the risk, no one would forgive himself for sinking one. Owing to a sequence of mistakes an allied airship a few months ago sank one, and it is a matter of extreme necessity—moral and material—that such a thing does not happen again. Possibly it will be, or as arranged now, that all such submarines work in areas apart from all other patrols, and will have exact limitations to their range of operation, otherwise operations are rendered very difficult for each of the hunting parties. There is no reliable method of distinguishing submarines on the surface; it is no use painting signs on them, as these are never seen, especially from aircraft. When on the surface the parachute smoke ball is very efficient, but the Germans will soon adopt that.

Method of Attack by Aircraft.

One has not much first-hand evidence of what the German submarine commanders do, or the reason they do certain things, but what is evident is that they are far from being as good as our own. Our aircraft have been attacked on very few occasions, although the odds are generally in favor of the submarine. There seems no strong reason why a German submarine caught on the surface almost invariably dives. His position is given away in any case, and there are often no surface craft near. As mentioned in reference to convoy work, it is useless to be down wind when attacking a submerged submarine; the same applies therefore with more force to a submarine on the surface. If when one is sighted the airship is up wind, she has a fair chance of getting her bombs on the submarine before he holes her. On the other hand, it would be the height of folly to crawl up to a submarine remaining on the surface with evident intention of attacking the airship. Incendiary bullets would at once finish off the ship as it approached at 10 to 15 miles per hour. The submarine by steaming away from the airship into the wind (say 25 miles per hour) at 15 knots would be moving at only 10 miles less speed, so that the obvious course to adopt in such a case is to follow the submarine out of range, while wirelessing for surface craft and maneuvring for position up to windward. The airship is then in a position to charge down on the submarine as the latter dives, and evidence of this must be carefully watched for. The submarine must eventually dive, and the aircraft has a large weight of depth charges in the approaching surface craft to finish off the work her bombs have started. The main thing to do is to destroy the enemy; and to throw away an airship by blundering slowly up against a wind to a submarine in what would certainly be an abortive attempt, would

be inexcusable. A little patience and discretion in such a case might mean success.

Flying in and out of low clouds is another method whereby airships may get a chance, and when following these tactics one must be always ready to attack at once.

It is very difficult to tell the degree of damage a German submarine has sustained. Authentic data exists of the habit of discharging oil from a special tank when bombed, and this is done to make the attackers believe they have so fatally injured the vessel that it is holed and unable to come to the surface. For some time these tactics succeeded, and the hunt was abandoned on this quantity of oil appearing. Nowadays it requires a large amount of oil to convince experienced officers. The best signs of the success of an attack are very large quantities of air, and of course such obvious signs as a submarine itself coming to the surface, rolling over, exploding, or some other definite signs. Cases exist in which some of the crew of the sunken submarine have come to the surface, either by way of the torpedo tube, conning tower, or after hatch, depending on the amount of damage and its position. A small point in the nature of a caution might usefully be inserted here, and that is that airships with the older type engines, circling round a suspicious object, sometimes found that minute drops of oil could be traced, apparently coming up. As the airship circled round, these sometimes appeared ahead of the ship. They are unmistakable, and it is impossible to confuse them with the smooth trace of oil left by a submarine.

Attacking Submarine on Surface.

(*a*) *When overhauling end on.*—Aim at a point *ahead of conning tower* in direction in which submarine is traveling. The allowance should be 200 feet for an estimated enemy speed of 15 knots, and a proportionate amount for other speeds.

(*b*) *When meeting end on.*—Exactly as in (*a*).

(*c*) *When attacking broadside on.*—Exactly as in (*a*).

Attacking Submerged Submarine.

The 2½ seconds' delay action fuse will cause the bomb to explode about 60 to 80 feet below the surface; during this time the bomb will travel forward under the water a horizontal distance of 20 to 25 feet. It must be remembered, too, that the submarine will be moving—probably quite slowly—not only during the time taken for the bomb to reach the water (which, as above stated, is 8 seconds for a height of 1,000 feet), but also during the 2½ seconds which the bomb is traveling under water. The precautions to be taken in attack to meet those conditions are:

(*a*) *When overhauling end on.*—Aim at a point 100 feet ahead of *probable position of conning tower,* in direction in which submarine is

traveling. The allowance ahead of 100 feet corresponds to an estimated enemy speed of 6 knots. As the real speed can not differ from this by more than a few knots, the allowance will never vary much from 100 feet. The *probable position of the conning tower* can be most simply estimated by remembering that most of the stationary wash the submarine leaves on diving is due to the conning tower, and shows where the conning tower was at the moment of submergence. It will not be far out to assume that in the average case the conning tower is 10 feet ahead of this stationary wash for *every second* which has elapsed since the moment of submergence.

(*b*) *When meeting end on.*—Exactly as in (*a*).

(*c*) *When attacking broadside on.*—As in (*a*), except that an allowance for the horizontal under-water motion of the bomb should be made by aiming 25 feet "*short*" in the direction of motion of the attacking aircraft.

Radius of Damage.

Experiments have recently been carried out by H. M. S. *Vernon* to determine the amount of damage caused to a British submarine (*D–1*) by the explosion of 300 pounds of 40/60 amatol, detonated at various depths below the fore end of the keel. These experiments show that if the distance between the keel and the charge be 50 feet or less, a submarine of this type will be rendered useless. This corresponds to the effect of a 500-pound bomb detonated at 52 feet or a 230-pound bomb at, say, 42 feet. If the dimensions of a submarine under attack were 22 feet diameter and 220 feet length, this would give the following effective target areas:

Bomb.	Horizontal dimensions of target.
500-pound	126 feet by 324 feet.
230-pound	100 feet by 304 feet.

It must be remembered, however, that with the introduction of submarines of stronger type the destructive radii will be diminished.

Size of Bomb.

Consideration of the above larger dimensions in conjunction with the accuracy achieved in bomb sighting on large American (*F–5*) flying boats, and the possible error in judging the position of the target, when submerged, has led to the adoption of the 230-pound and 500-pound bombs, in place of the 100-pound bomb, for submarine attack.

It is considered that it may prove useful to carry a few small bombs—e. g., 50-pound or 100-pound—for attack on any submarine which may be encountered on the surface after the heavier bombs have been dropped. The use of these smaller bombs would have a considerable moral effect in deterring submarines from coming to the surface to attack aircraft when the latter are believed to have got rid of their larger bombs.

Escaping Air and Oil.

It must be remembered that any air bubbles escaping from the submarine will rise, but slowly, so that the submarine may be some distance away from the spot at which the bubbles break on the surface.

Thus, if the submarine be at a depth of 50 feet and proceeding at 6 knots, the bubbles will break the surface at a spot about 300 feet astern. The same remarks apply to leaking oil, except that the allowance in this case would be about 400 feet instead of 300 feet. For depths greater than 50 feet the allowances will be in proportion.

Miscellaneous Notes.

An important point to note is that submarines almost invariably turn toward victim's stern after attack. The reason is obvious, as such a course prevents the attacked vessel, if missed, turning toward submarine and ramming.

Submarines usually submerge on firing torpedo, and then come up again to examine extent of damage, get vessel's name, etc. This is, of course, in attacking single ships. If escorted, or there is any other danger, they dive at once to a safe depth, as indicated previously.

In hazy weather our submarines have often been passed by quite closely and unnoticed by Zeppelins and seaplanes.

The submarine that torpedoed the *Moldavia* had her periscope concealed by a soap box, and it was not seen until too late that the innocent-looking box was floating against the tide.

Cases may occur of submarines having a shot at the convoy and failing (or even being successful) and waiting until the convoy has gone on, say, 10 miles. Owing to the slow speed of the convoy the submarine would have time to come to the surface and encircle the convoy at full speed, lying in wait for it farther on its course, attacking from one-fourth to three-fourths mile. This is a case where aircraft is valuable, and such possibilities should be borne in mind. Attack on unescorted ships is generally made from less than a quarter mile on either bow ahead.

An airship on patrol early one morning sighted on the horizon what it mistook for a submarine; the object was some 15 miles away and showed merely as a thickening on the horizon. Full speed was made for the supposed submarine, all being in readiness for the attack. Nearer approach, however, showed that it was a capsized torpedoed steamer with a small lump in the middle, looking like a submarine at a distance. As it was an evident danger to navigation, it was decided to bomb it, but a careful examination was made at a low altitude. It was then seen that there was a water-logged lifeboat with four live men sitting in couples at the bow and stern, and a number of dead bodies floating in the boat. Another man was also seen

swimming in the water. Help was at once wirelessed for and the survivors ultimately rescued. The ship had been torpedoed some three hours previously. What it is desired to emphasize is the need for careful examination of everything, if possible, before taking action. Serious consequences may otherwise result. Had the airship bombed the vessel in this instance it would have certainly finished off the survivors. Another point is that the vessel might have been carrying explosives which had been unaffected by the torpedoing but which might have been exploded by the bombs. In such a case the aircraft would certainly be destroyed.

For some time after a vessel sinks there are innumerable light-green bubbles rising in a vertical column to the surface. This must not be mistaken for the light-green color of a submarine about 30 feet under the surface. There will be a considerable amount of wreckage and oil on the surface for some time.

A great many German submarines now carry special periscopes, which can be used for searching for aircraft, in addition to the usual horizontal vision.

The exhaust from the submarine is through a pipe at the stern, just above the water line, and in cruising the compensating and trimming tanks are always kept adjusted, so that to submerge only the external ballast tanks have to be filled. At the same time the main motors are started forward to force the boat under by means of the hydroplanes. When a submarine dives quickly, a cloud of steam and black smoke may be observed, caused by the fuel oil being discharged unconsumed into the exhaust pipe, and this, with the absence of air, causing partial combustion, accounts for the patch of oil seen when a submarine dives. It is apt to give surface craft the impression that they have scored a hit. The steam is due to the hot exhaust pipe coming in contact with the water.

Further important information concerning the habits and behavior of German submarines when attacked has been obtained, and this is of great interest as showing that it is not always necessary to get a direct hit to bring about the destruction or surrender of the submarine. What is also made clear is the necessity for a deeper setting for depth charges, and it is thought airships should have three heavy bombs (the 230-pound, 2½ seconds delay) set for at least 120 to 150 feet, instead of the 80-foot setting at present existing. Within reason, the deeper setting the better, as an explosion under a submarine will stand a good chance of bringing him to the surface, whereas one at too shallow a depth may force him farther down.

Submarines are much perturbed by depth charges, and that it is not essential for the hull of the submarine to be ruptured has been indicated before, the explosions causing a leak, fracture of batteries,

etc. Complications have been set up which have ultimately had the required result—the sinking of the boat. A point to note here is that the latest practice seems to be to scatter a liberal supply of depth charges over the submarine, and this scheme appears ideal.

There seems to be at least as much chance of doing fatal injury to the enemy with such methods as with a prodigal use of shells in France. Possibly some modifications of the barrage system will be applied to submarine hunting.

The following very valuable data of the causes leading up to the sinking of two German submarines will be of interest, and should prove extremely useful in helping one to realize what effect one's own attacks may have. Possibly such a knowledge of what the "hunted" feels and what he might do under given circumstances may be sufficient to turn an attack into success. The examples prove what has been said before, that patience and endurance are qualities that go far toward success in antisubmarine work, and that after an attack the attacker must remain in the area until it is quite clear that the submarine has been sunk, or escaped.

Case of U. 9.05. Heavy explosion of depth charge. Three detonations very close. Noise of destroyer's propellers pass over shortly afterwards. Explosions sufficiently violent to stop boat's chronometer and shake the vessel throughout length. Damage not considered important at first. Small leak then observed in motor compartment of torpedo loading hatch, the rubber gasket being driven in for a length of about a foot. Moderate amount of water enters, falling on port electric motor, which burns out. Exhaust pumps cease to operate. Submarine, continuing with starboard electric motor, has to run with high inclination forward, because of the invasion of the water. This becomes so pronounced that commander of submarine sends the entire crew forward to counteract this inclination. In this moving of weight to reestablish the trim, water sweeps over starboard motor, and also being burnt out. The commander then decides to surrender, and comes up to the surface.

Case of U. A depth charge from a destroyer exploded aft of the submarine and damaged the hydroplanes. The submarine lost her trim and was down by the stern. Orders were given to submerge farther, but when at a depth of 130 feet the boat began to rise and continued this till 40 feet was reached, when a second depth charge exploded, throwing the machinery out of action.

A further attempt was made to submerge and the boat seems to have reached approximately 270 feet, when the compressed air gave out and the batteries began to develop dangerous fumes. The commander then gave orders for the explosive charges to be prepared and brought the boat to the surface and surrendered.

The explosive charges are bombs used for sinking a submarine after surrender and are usually placed near a torpedo head.

German submarines are advised to patrol along the 20 to 30 fathom line, i. e., nearer the coast than the open sea, "so that it may be possible to lie on the bottom in the event of the boat being unable to keep her depth." This is also so that there is a margin of depth in the case of involuntary dive. Magnetic devices could possibly be used with success against submarines lying on the bottom or even proceeding slowly. It is recognized by the German commanders that they leave oil traces. In fact, instructions are issued advising them to lie on the bottom in the event of the boat being unable to keep her depth "provided the hull is *absolutely tight*" and that there is no leakage of air and above all *no oil bubbles*. It seems that the German staff have profited by occasions similar to that cited on page 31 and realize the importance of the oil question. That submarines never lie on rock bottoms is perhaps obvious. They choose sandy or gravel if available, but the general practice is to proceed dead slow if in danger, or forced to submerge.

In connection with the oil question, and lying on the bottom, some very useful data have been compiled showing the approximate position for bombing a submarine lying on the bottom from which oil or air bubbles are escaping. Were the submarine moving, its course and speed would need to be conjectured approximately and allowed for. The strength of tide must be known and its course will be seen.

Naturally the air will rise much faster than the oil. *If there is no tide the air and oil lines will be vertically above the submarine.*

The futility of bombing oil patches and lines of oil unless a submarine is known to be there is obvious.

A very recent case of an airship successfully attacking a submarine is that of H. M. A. C 4, off Flamborough. Airships had been patrolling the area, but immediately on their leaving a submarine rose to the surface and attacked a steamer. This incident is still further evidence of the very large amount of negative work airships have all along been doing.

The airship received the information from her base, returned to the area, and found the submarine still on the surface. Bombs are dropped with success, and it is interesting to note that the crew saw the submarine submerged before dropping the bombs, although he had immediately dived on sighting the airship.

General Observations.

The following general observations upon the naval activities of the Great War are submitted:

(*a*) One can not fail to be impressed with the frightful forces which now may be applied through the agency of modern weapons.

Also one can hardly fail to take notice of the tremendous speed at which weapons may be moved, and of the mobility possessed by carriers of weapons. These last two details tremendously widen the area of intensive naval operations.

While the gun remains to-day as the supremely destructive agent in naval warfare, nevertheless the mine, the torpedo, and the bomb are to be taken into serious account by the seaman, and his strategy and tactics must consider the destructiveness of these weapons. It is not sufficient to base naval strength on battleships alone, or in the power of great guns. Geographical and hydrographic conditions have taken on increased importance. The prodigious power to do damage now contained in a vessel moving at high speed vastly enhances the importance of obtaining information. With information acquired the power may be applied or perhaps evaded, provided speed is sufficient.

In the Battle of Jutland, both the British and the German fleets were made up of groups of fast and slow vessels. The slow and older ships failed to exert offensive strength, and acted rather as deterrents to the efforts of the commander in chief to apply his force.

Both fleets would have been better off without these older vessels, which exercised no helpful influence on the fortunes of the side to which they were attached, or any way affected the results of the encounter.

Old battleships with poor speed, low-powered guns, ineffective subdivision and underwater protection can be looked upon only as obstacles to up-to-date efficiency in modern fleet operations, in which speed, mobility, and power are all closely correlated.

It is believed that this lesson was very clearly pointed out, and as a result we see to-day the British fleet denuding itself of obsolete types in a drastic and thorough fashion. It is thought the United States should proceed along this line, despite the ever-present objection to discarding old ships and old weapons, which are as difficult to abandon on the part of the Government as is an old garment to an elderly man.

The necessity of having craft of special types and all of the variety of units which enable the commander in chief to threaten the enemy along many lines would seem important. One can not to-day or in the future pin his faith upon one type alone, or upon a single weapon, or upon any one style of tactics. Methods and types will surely be supplied to counter standardization of this kind. The key to success is supplied through surprise.

Finally, one must note the development of aviation in the British Grand Fleet. Toward the close of the war it became manifest that this arm had definitely acquired a position of tremendous importance

and that it had definitely come to stay as a naval arm. Vessels of special types and characteristics were developed for aviation purposes. To-day we note that the British Grand Fleet contains 4 great vessels of the carrier class, each of which conveys about 20 airplanes. It has been published in the press that the Japanese fleet has already experimented with this type, and is about to build two airplane carriers.

It is needless to point out that up to the present the United States Navy, the second largest in the world, has had no vessels of this type. Without such craft our fleet requirements can not be determined and aviation can not have the mobility belonging to our naval force. It would also seem unnecessary to indicate that the latter is a line along which progress must be made, and the importance of taking the preliminary steps would seem supreme.

Fig. 1

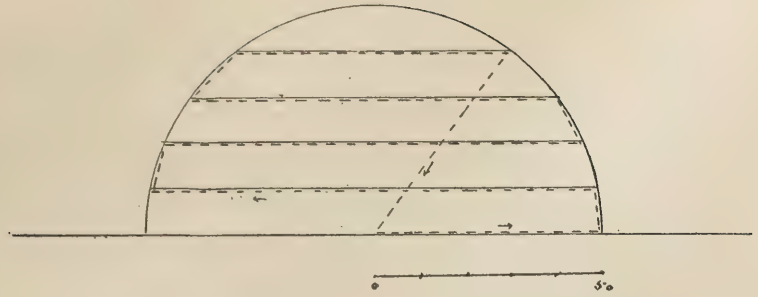
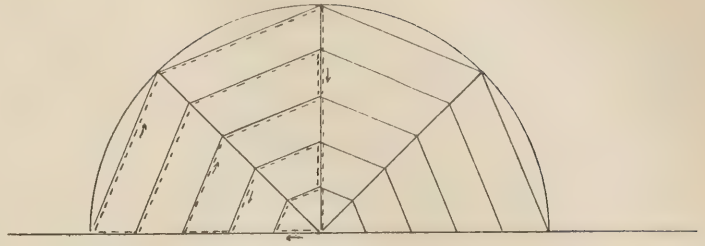


Fig. 2



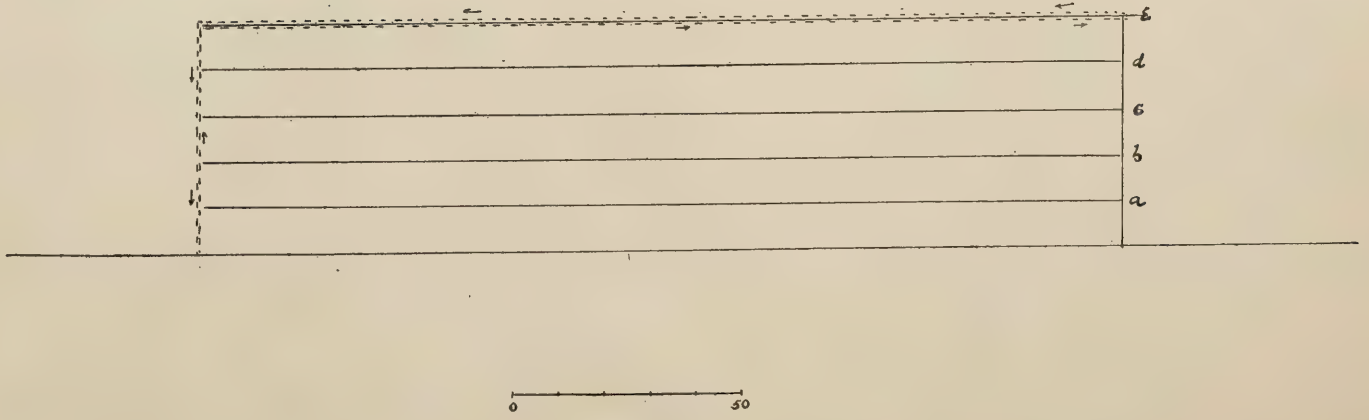


Fig. 3

AVIATION.

NOTES ON AIR SCOUTING.

Source: Lieutenant Colonel L. C. Lucas, U. S. M. C.

The following notes on past and probable future performances of aircraft are founded on information gathered from aviation hearings during the past year, by conferences with aviation and other officers, and from reports, etc.

The work performed by our Air Service during the last war was confined to coast patrol, convoy, and bombing. No experience was had in long-distance scouting. No attempt will be made to consider all probable uses of the airplane, but only to indicate the possibilities for scouting.

Coast Patrol.

An airplane with 500 miles endurance can cover the area bounded by a semicircle of 50 miles radius, assuming that in favorable weather conditions a submarine on the surface can be seen 5 miles.[1] This may be done, as shown typically, by passing back and forth across the area or on some such pattern as the "Spider web." (Figures 1 and 2.)

The point of departure may be at the apex of a salient or a reentrant angle. The area may also include waters that are not available for use—for instance, such as shoals or mine fields—and there would be variations so that each station is confronted with a local problem requiring its own solution. Some such pattern as above indicated, with the area blocked off in squares for ready reference, will enable an area of this extent to be covered from one station.

In the case of an extended coast line such as our east coast, the area to a certain distance from the shore may be covered by flights from and returning to the stations or flights to the next station on the flank. (Figure 3.) The flight of one of the five airplanes only is indicated by dotted lines.

Airplanes can not be expected to operate in winds of more than 40 knots velocity. The areas covered will, of course, depend upon the endurance of the airplane, but the examples given will give an idea of how much can be scouted. In addition to the airplane there is the dirigible and the kite balloon.

[1] The mile is the nautical mile.

In this scouting it is no disadvantage to pass over the same area a second time while searching for submarines, for a submarine submerged may not be discovered, and the length of time that the airplane is in the air is of more importance than is the complete search by passing over every point once.

The study of long-distance scouting must be entirely theoretical at present. Consider the question of occupying a line in such a manner as the enemy can not pass it without being discovered.

(Figure 4.) Assume the distance AC (insert on right), the supposed night run of the enemy, and CE, the day run, each of 12 hours. Airplanes, 500 miles endurance at 80 knots; wind, 9 knots as shown. Let T (large figure) be the position of the airplane carrier. (T on the line CD at noon.) Assume radius of visibility 30 miles. In order to search the area ABDC, beginning at 6 a. m., the airplanes *a*, *b*, *c*, *d*, *e*, would proceed as shown:

a and *e* at 73 miles per hour.
b and *d* at 72 miles per hour.
c at 71 miles per hour.
a and *e*, 176 miles, 2 hours 35 minutes.
b and *d*, 140 miles, 1 hour 55 minutes.
c, 126 miles, 1 hour 45 minutes.

If the times of departure are taken properly, the airplanes should arrive on the line GH simultaneously, and that will be the position of the line AB at this time, assuming the enemy's advance to be 15 knots per hour. The airplanes then sweeping in line abreast, traveling 159 miles at 89 knots per hour will reach the line IK by the time the line CD will have reached IK at 15 knots, and the original area ABDC will be searched as shown. The planes then returning to the ship will result in the total times in the air:

a and *e*, 5 hours 45 minutes.
b and *d*, 4 hours 30 minutes.
c, 3 hours 50 minutes.

In order to extend this area by one more plane on the flank, the time in the air of the flank plane would be 7 hours 15 minutes, which is beyond the assumed endurance. So that it can be said that with these assumptions an airplane carrier can observe a line 300 miles long, the distance P′ to T being 150 miles. As shown in figure 5, an afternoon flight proceeds to the line EF when it has reached the position LM, at such a time that the airplanes will return to the ship by 6 p. m. By a forenoon and afternoon flight the assumed daylight zone and night zone will be searched. In this way a single ship can observe a line 300 miles long under the assumed conditions, since the entire 24-hour run of the enemy is covered.

(Figure 6.) Assuming a 25-knot wind as shown, the times of flight are increased so that covering a 300-mile front the longest flight is

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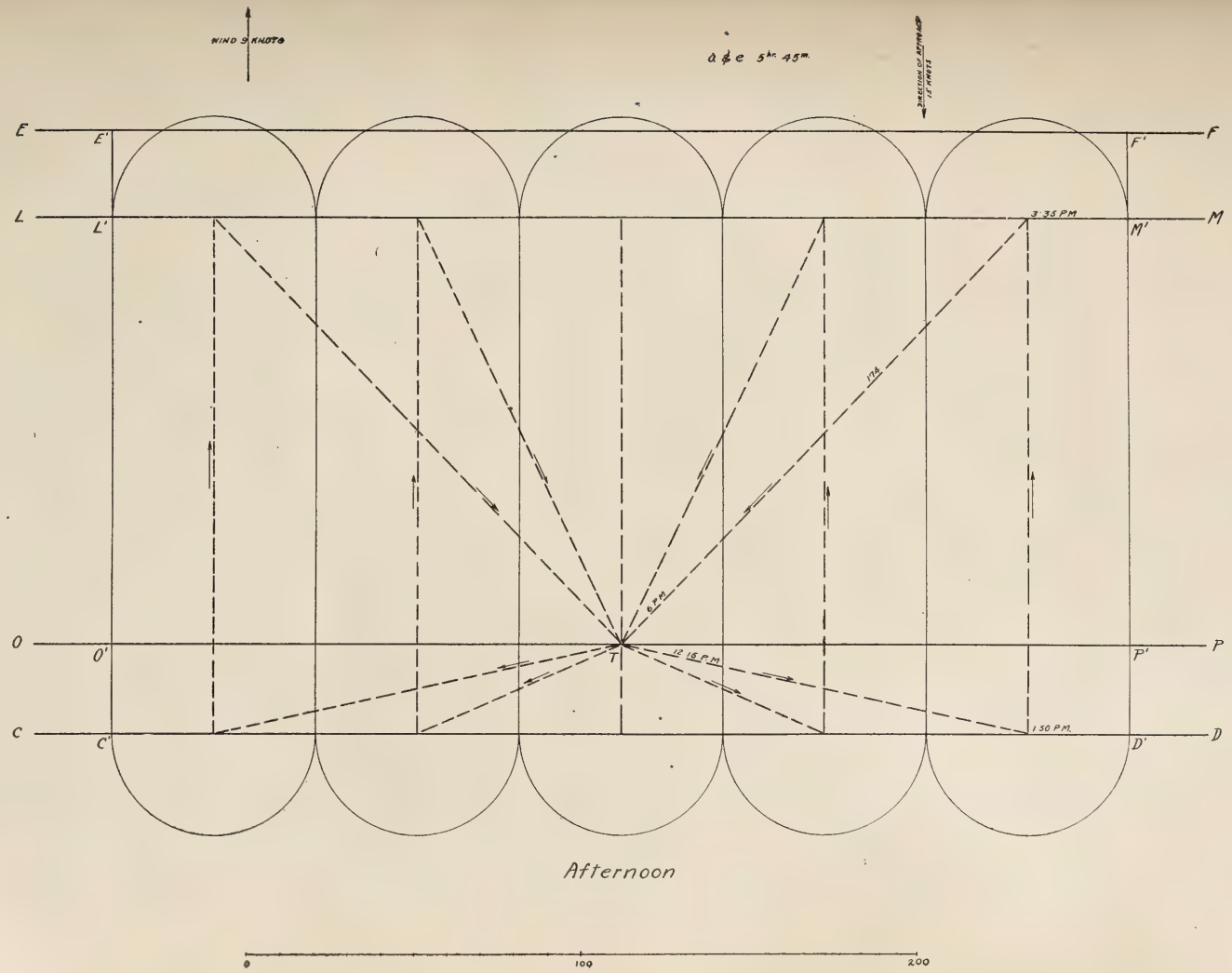
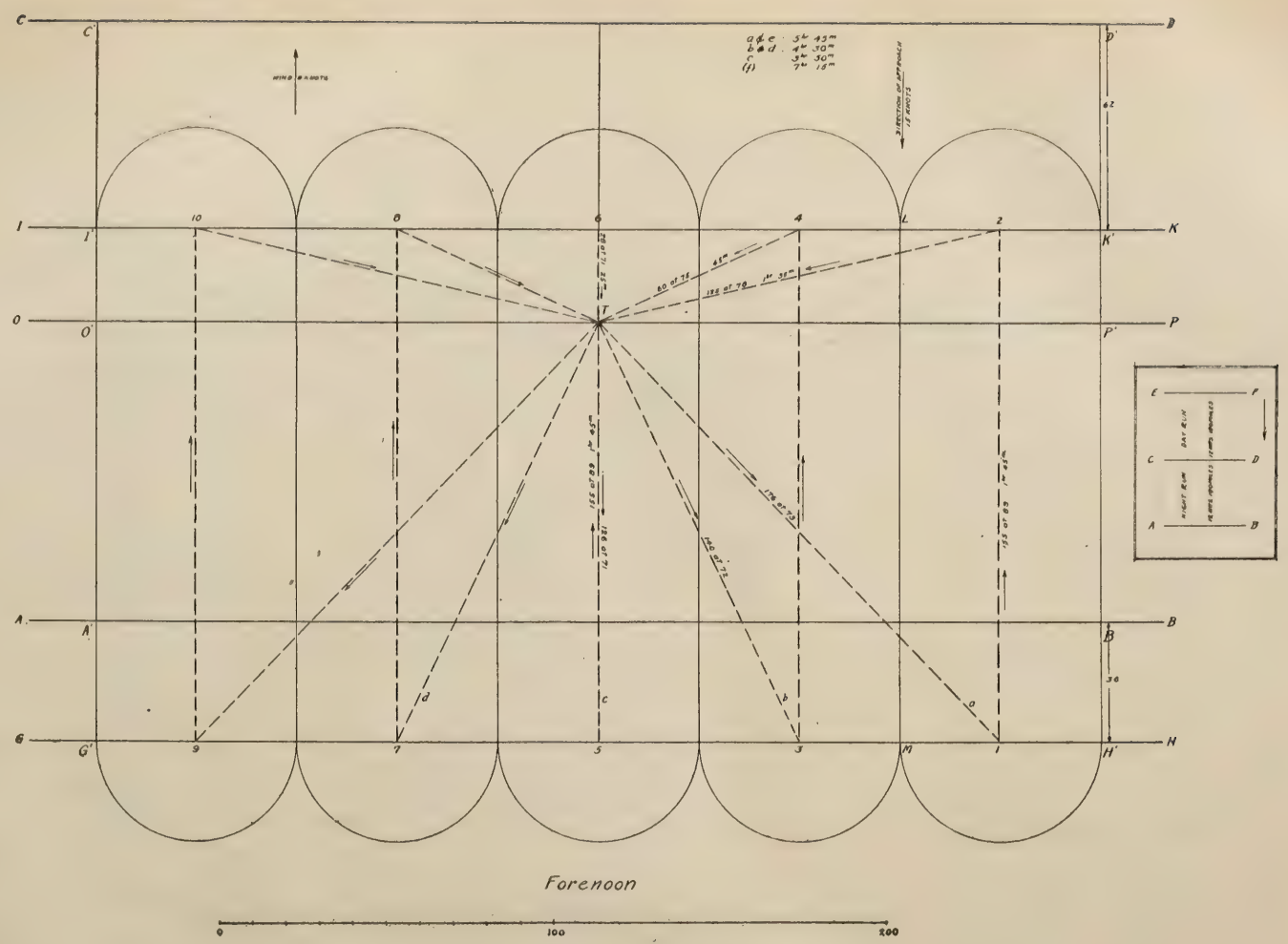


Afternoon

Fig. 5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36
Forenoon
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100
200

Fig. 6

6 hours and 15 minutes, the entire assumed endurance of the airplane. In stronger winds the area searched must be reduced laterally and beyond about 40 knots the airplanes could not be expected to operate.

To cover the line from Bermuda to Nova Scotia, 600 miles, two airplane carriers would suffice. The airplanes would have to fly in pairs in order to assure the sweeping of the areas in case of forced landing. It has even been recommended that three planes fly together. Assuming that a section of two planes is used there will be 10 single flights in the forenoon and 10 in the afternoon, or 20 for the day. If two-thirds of the planes on board are available for use, the ship should carry 30 scouting planes. This is in addition to the fighting and bombing planes that she may have. If this is beyond the storage capacity of the airplane carrier the number of carriers would have to be increased. Experience at one patrol station was that at first, with green personnel and new planes, there was a forced landing every four flights. A year later, the average was about one in 40 flights. Figure 6a indicated the area that would be covered by this system, observing a line 600 miles long southeast of Nova Scotia and covering the great circle courses from northern Europe approaching our eastern coast from Nova Scotia to Bermuda. Airplane carriers enough to handle 60 planes would be required.

(Figure 7.) In order to scout a line by patrolling, assume line of carriers on the line AB. A carrier at T, under the assumptions as above, will cover a belt 60 miles wide and 160 miles each way, or 320 miles in all; a 20-knot wind blowing along the line will reduce the lateral distance to 150 miles, so that it can be said that this system will cover an area about 300 miles wide, or the same as is done by the other method. Since two lines are needed, distant apart equal to an assumed night run of the enemy, another line, CD, will have to be held. Since an enemy can cross a belt 60 miles wide in four hours, two hours out and two hours back is the limit for the airplane. Since two airplanes would be used in each flight there would be four away from the ship at one time and three flying intervals for each 12 hours would make 12 airplanes in flight each day for each ship. Allowing 50 per cent extra for replacement, each carrier would have 18 reconnaissance planes. For each belt of 300 miles in width, 2 ships with 36 airplanes would be needed. This is not as economical as the previous plan which covers the area with 1 ship and 30 airplanes.

The consensus of opinion is that the airplane at present is not sufficiently reliable to take up duty of this kind day after day. An airplane carrier would have to be accompanied by other ships continually picking up broken-down planes and it might be that these ships placed on the line would form as effective a screen; depending,

of course, on the number of casualties and the ease with which disabled planes could be recovered.

The strain on the pilots would have to be considered as well as the waste of material. It is expected that planes, landed alongside, can be picked up in winds up to 30 or 40 knots.

The airplane can fly from and return to the ship, whereas the dirigible must return to a shore station. The presence of the airplane on board ship allows very valuable duty of certain kinds to be performed. For instance, the airplane service can assure a convoy commander that he will not be interfered with during a run in a certain direction. This service is limited. It simply extends the radius of visibility in certain directions at certain times. The commander of a fleet may want to know whether his fleet can be brought to action by the enemy before dark, for instance. This can be told him with certainty by the airplane service. The ability to sight a ship or number of ships from an airplane without the presence of the airplane being known to the enemy introduces a new element in the question. The only safe assumption to act upon is for the commander of a fleet or convoy to assume that the enemy knows his position and course and has photographs of his command. One result of this will be probable changes of course every night in order not to be in the presence of the enemy at daylight if attempting to avoid him; and if searching for the enemy, he must be picked up again after daylight if he has changed course during the night. The following example of limited use is given to show the great advantage of the possession of airplanes to the searching force. The problem is modeled after one from the Naval War College.

(Figure 8). Assume the convoy sailing from Cape Henry at 5 a. m., assumed speed 10 knots, to join a fleet operating in the vicinity of Culebra. An enemy's scouting force starts from Bermuda in pursuit two days later, assumed speed 20 knots. The line of scouts will reach the line *ab*, for the 7 p. m. position of the third day. Without the use of airplanes, the line would then withdraw to *cd*, for the position 5 a. m. of the fourth day. During that day, the fourth, they would proceed as shown and should the convoy be proceeding direct to Culebra, would be in contact late in the forenoon; or if the convoy were proceeding to Mona Passage, it would be encountered about the middle of the afternoon. Should the convoy be proceeding to the Windward Channel and the pursuit not conducted beyond the islands, the convoy would escape.

With airplanes, let it be assumed that early in the afternoon of the third day each scout would send forward a pair of airplanes to what would be the position they would occupy by continuing the search to the 7 p. m. position circle of the convoy, and then return to the 7 p. m. position of their scouting line. By that time (7 p. m.)

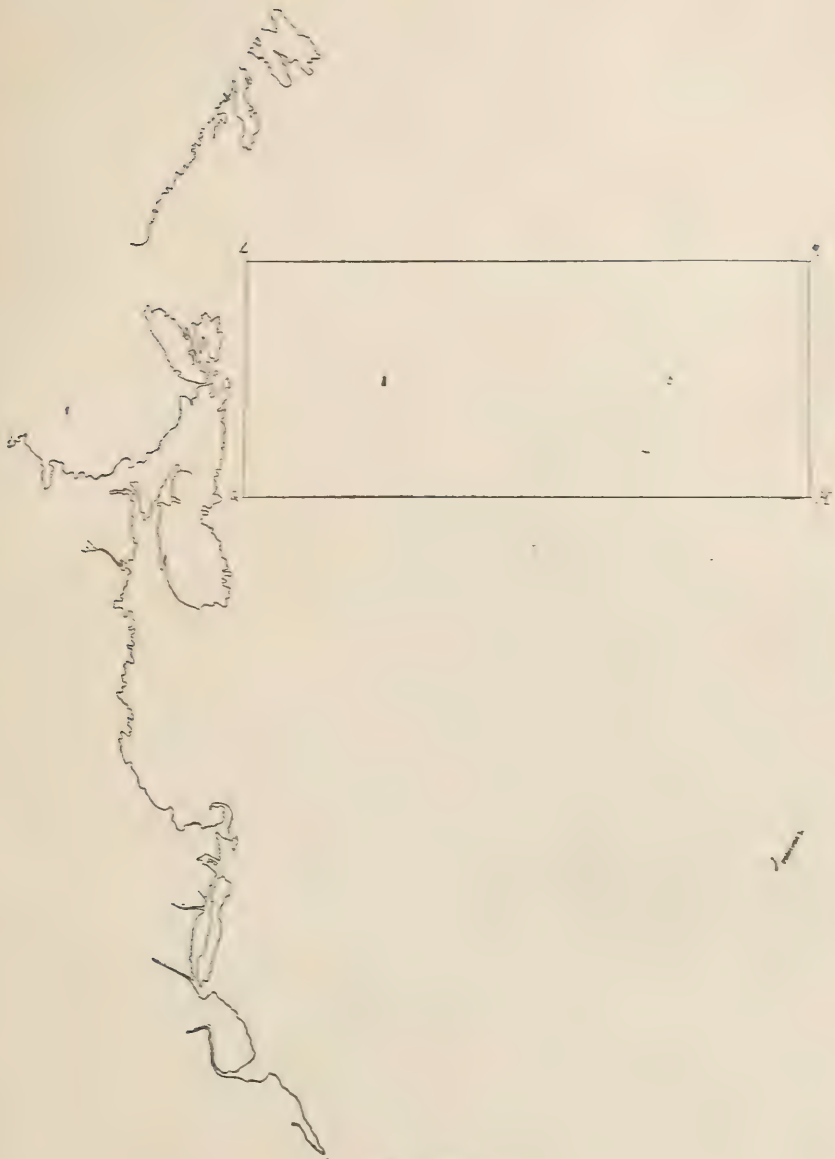


Fig. 6*a*

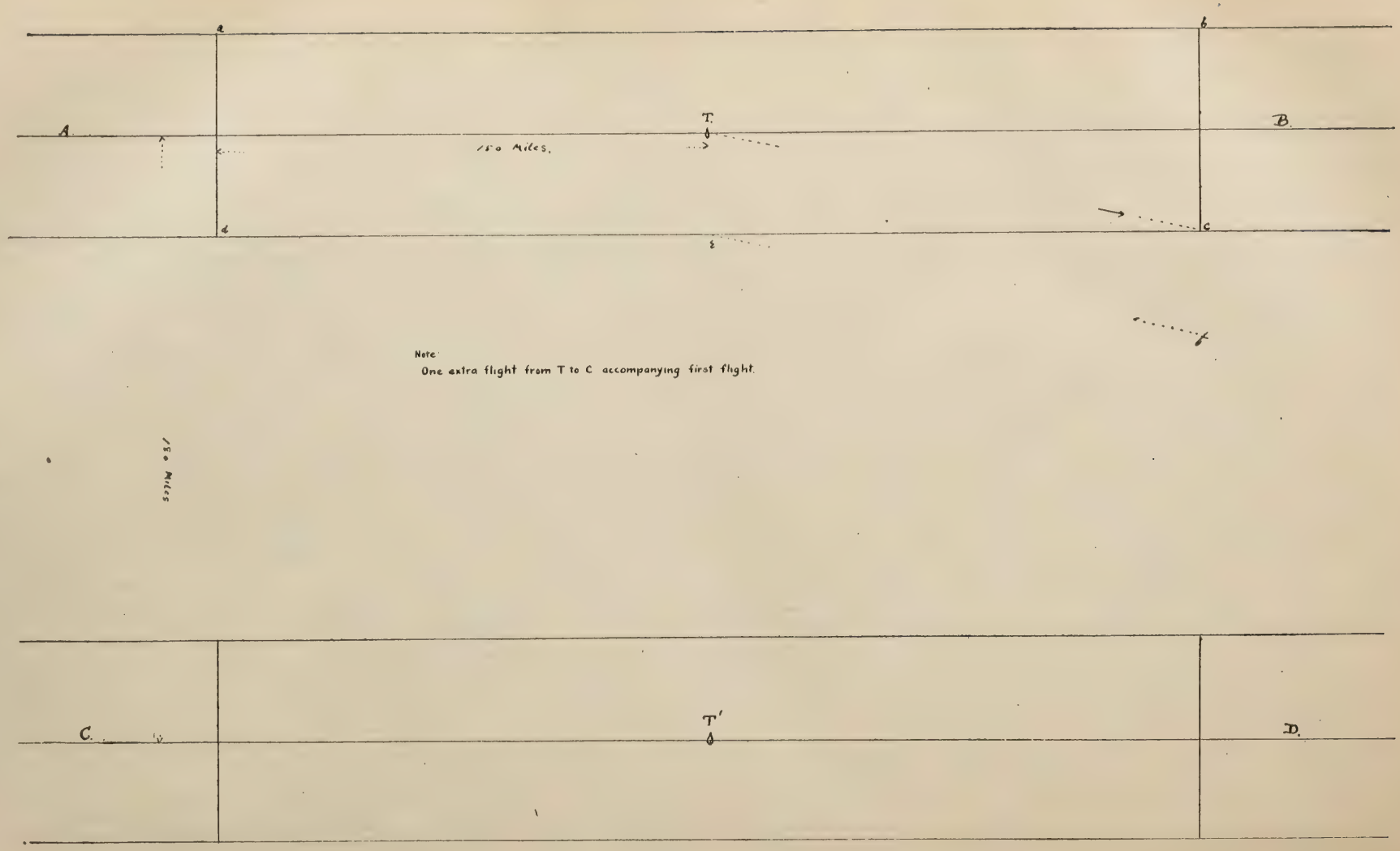

a
b
A
T
B
150 Miles.
d
c
e
f
Note
One extra flight from T to C accompanying first flight.
150 Miles
C.
T'
D.

Fig. 7

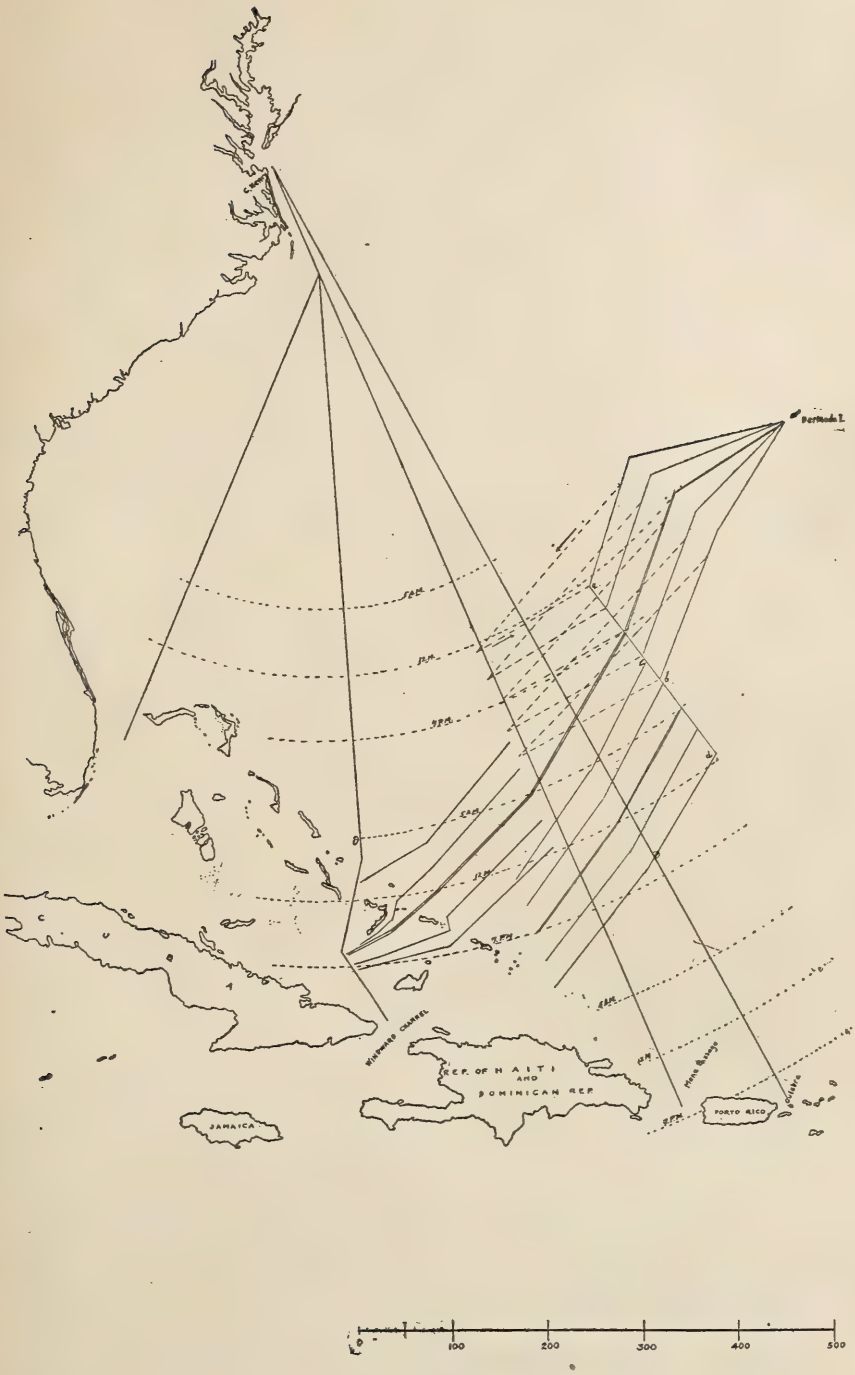
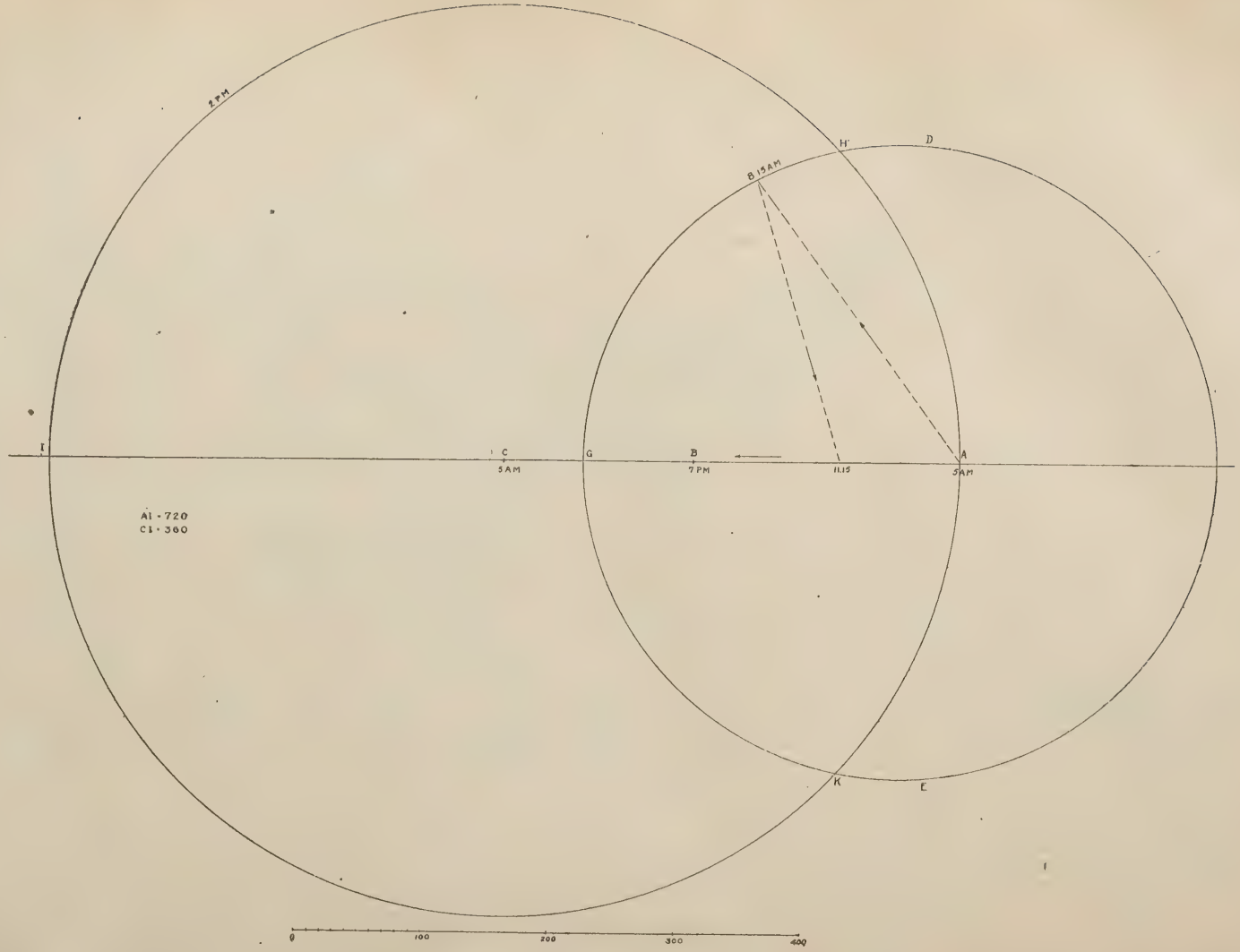

Bermuda I.
WINDWARD CHANNEL
REP. OF HAITI
AND
DOMINICAN REP.
JAMAICA
PORTO RICO
0
100
200
300
400
500

Fig. 8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E
0
100
200
300
400

Fig. 9

should the convoy be sailing to Culebra or to Mona Passage, this will be known and the convoy might be picked up at its daylight position. Should no information be obtained, the searching force, instead of retiring to the line *cd*, can steam to the position on the 5 a. m. of the fourth position circle of the convoy as shown, and should the convoy be making for the Windward Channel it would be captured on the afternoon of the fourth. It can be seen that about 120 miles has been added to the radius of operations of the first day and in this case, should the convoy be proceeding to Culebra or Mona Passage, instead of encountering it late in the forenoon or in the afternoon, it would be picked up at daylight, and instead of missing the convoy entirely, should it be proceeding to the Windward Channel, a capture would be made there.

It is anticipated that in cases of this kind, or in such special cases as mentioned above where it is required to know if the fleet can be brought to action before dark, etc., the sacrifice of one or more planes through forced landing would be accepted as the ordinary fortune of war.

(Figure 9). To illustrate a use and limitation of the short-distance reconnaissance plane, let it be assumed that the airplane has an endurance of 500 miles at 80 knots an hour.

Assume the convoy at 15 knots with 14 hours daylight and 10 hours darkness. Suppose the enemy knows the position, course, and speed of the convoy and intends to attack with a division of destroyers. Let the position of the convoy at 5 a. m. be A, at 7 p. m. be B, and at 5 a. m. the next morning, C. Airplanes leaving the convoy at A at 5 a. m. and rejoining the convoy at B at 7 p. m. would reach out as far as the ellipse DE. Assuming the destroyers able to make 25 knots and starting at a distance of 24 hours from A, there will be an area between HGK and HIK from which the attack can be delivered and which can not be covered by the airplane reconnaissance. In order to observe this area a radius of 720 miles at 80 knots will be necessary, seeing that the circle HIK is free from the enemy at 2 p. m., if the convoy commander is to be assured that he can not be attacked during the night, manifestly beyond the capabilities of this airplane.[2] In scouting the area as in figure 4, scouting on patrol as in figure 7, in the case of the search as in figure 8, and in the case of protecting the convoy as in figure 9, length of time in the air is not the quality of greatest importance. The endurance of the airplane increases slowly with decrease in speed, while an increase in speed rapidly decreases the time until the necessary information is obtained. The faster the airplane the more advantageous for

[2] The airplane would then have 5 hours at 102 knots in order to reach the 7 p. m. position of the convoy at that time. Total, 1,230 miles.

scouting. In patrolling, the length of time in the air is determined by the distance the enemy can be seen from the aircraft and the speed of the enemy. Consequently the distance covered varies directly with the speed. In other cases it amounts to stating that the faster the airplane the less time it takes to go to the outer position and get information back to the ship and, therefore, the less time consumed in getting contact and the longer time till dark.

(Figure 10.) As an example of limited use under the same assumptions of speed, a convoy at A sending out airplanes direct to the positions 1 to 8 would know at 11.15 a. m. that he would be safe from attack for the rest of the day from an enemy within the area embraced by the sector MON plus the areas covered by the radius of visibility from the airplane. All airplanes would rejoin the convoy at 2.15 p. m. This with the 500-mile reconnaissance plane.

(Figure 11.) In order that the airplane leaving at 5 o'clock in the morning will be able to cover the distances such that the convoy is safe from attack without warning until 7 p. m., figure 11 shows that with the flights as indicated, a front of 420 miles can be covered by seven airplanes; 850 miles at 100 knots is necessary for this. The information that no attack can be made from within the area covered would be assumed by the convoy commander at 9.45 a. m. from the fact that at that time the airplanes should all be on the arc ON and no report has been received by radio of sighting the enemy. The airplanes would all be returned at 1.30 p. m. The convoy will be traveling in waters scouted for a width of 420 miles, except for that very critical time at daylight in the morning when probably no scouting would indicate the presence of the enemy until too late. Extending this, to determine how many airplanes are required under the above assumptions in order to assure the convoy commander that he can not be attacked from any direction without warning, figure 12 indicates that if the necessary airplanes are on the circle MN at 9.35 in the morning, which is the length of time taken to reach the farthest positions, no attack can be made during that day. The radius of the circle is the assumed run of destroyers from 9.35 to dark. There will still be that critical time, at daylight, but when the airplanes are well on their way notices should be received in order that whatever dispositions can be made may be taken advantage of. The flights are plotted only in the upper semicircle and the circle indicates that 15 flights will be required.

(Figure 13A.) With a 70-knot plane the distances covered are less. Consequently, the number of airplanes is less, 13 instead of 15 being necessary, but the penalty paid is that it is 11 o'clock instead of 9.35 before the valuable information is received that no attack can be made before 7 p. m. by vessels making 25 knots or less.

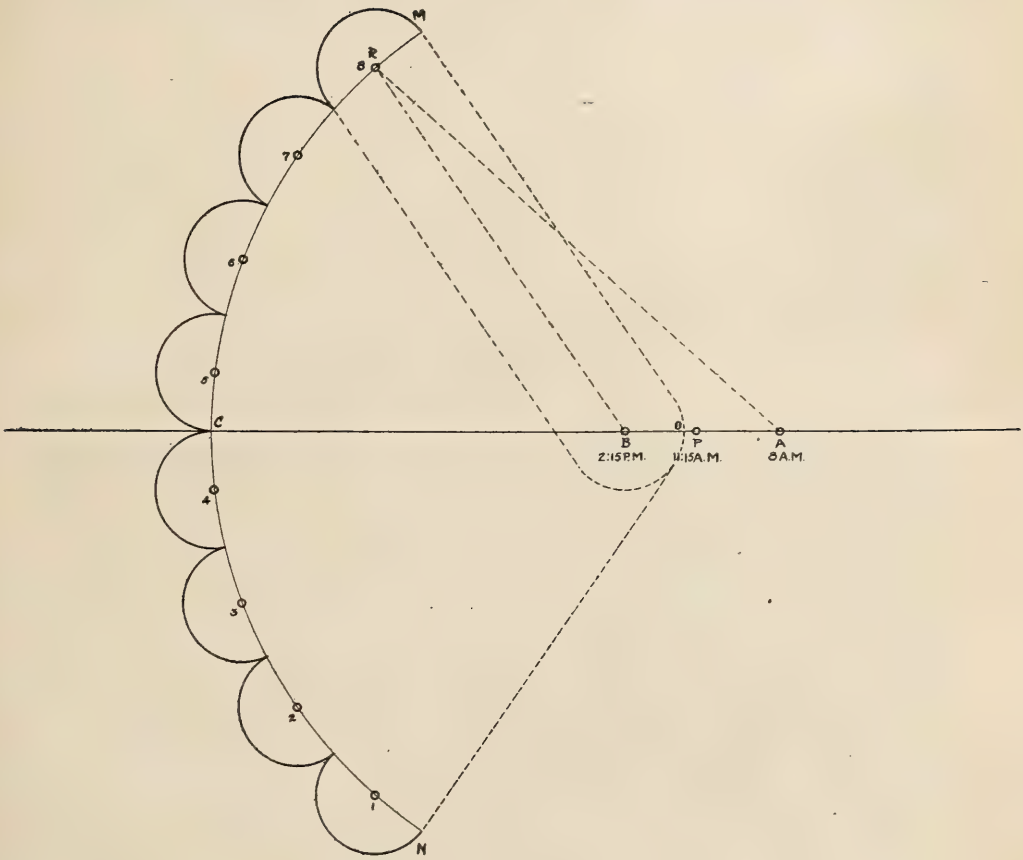
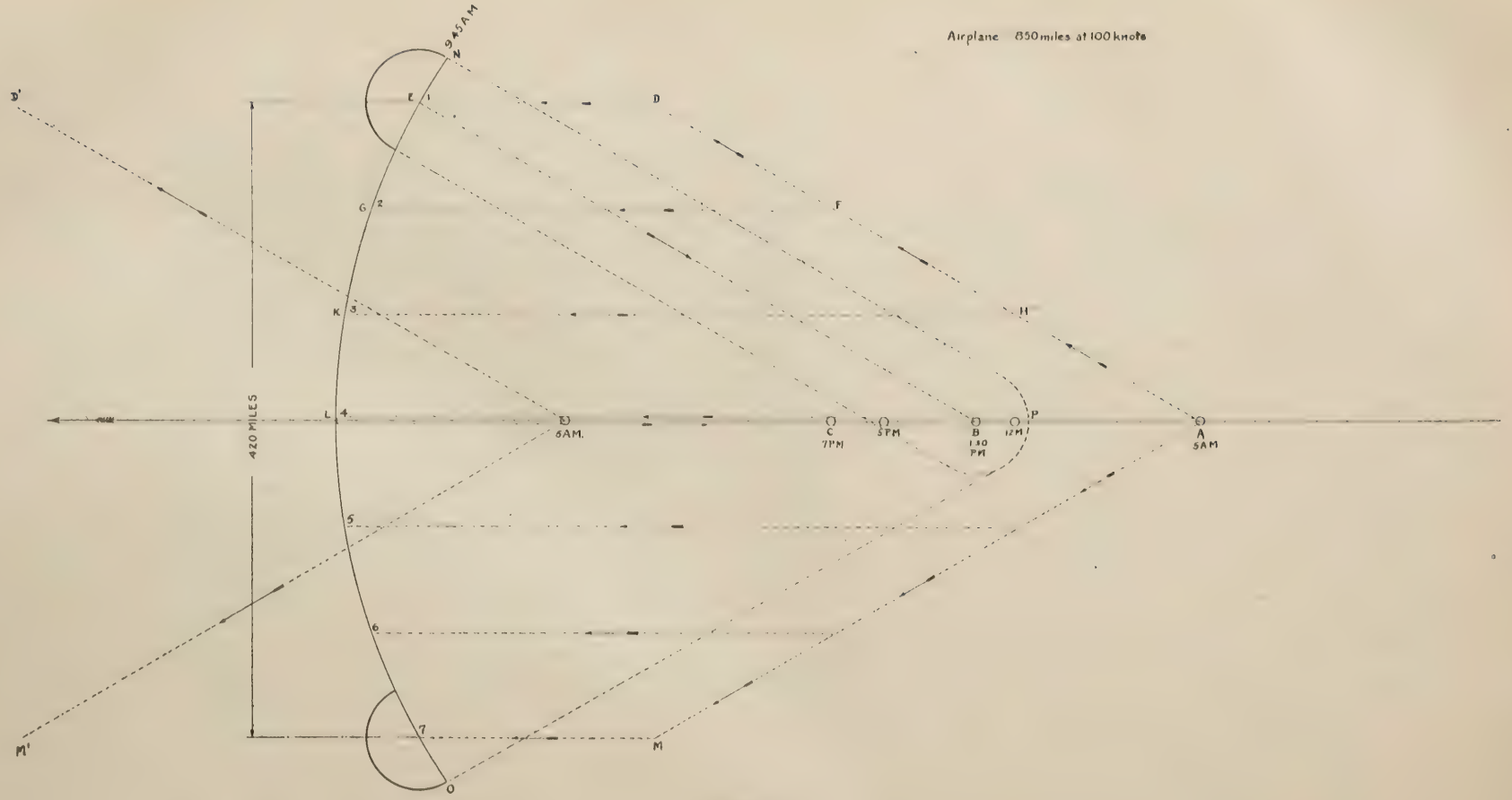


Fig. 10


Airplane 850 miles at 100 knots
9:45 AM
N
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E
1
D
G
2
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420 MILES
L
4
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Fig. 11

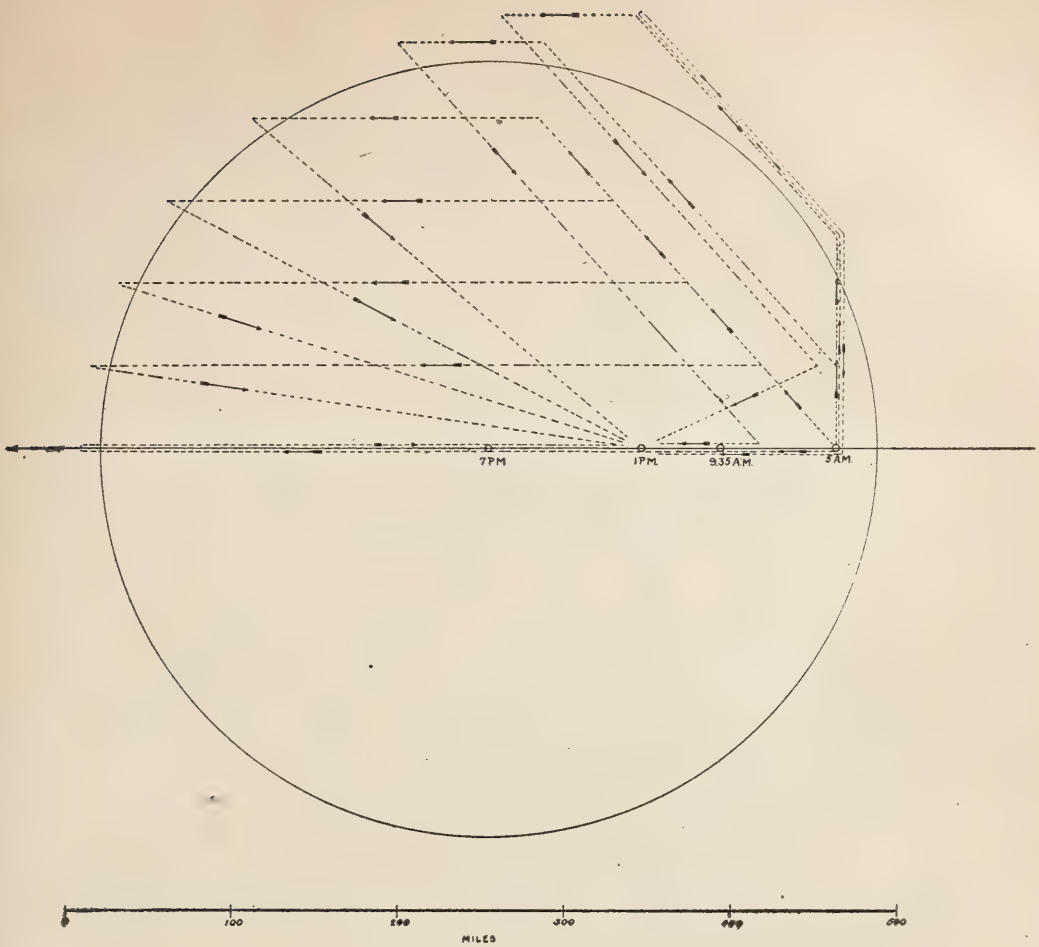


Fig. 12

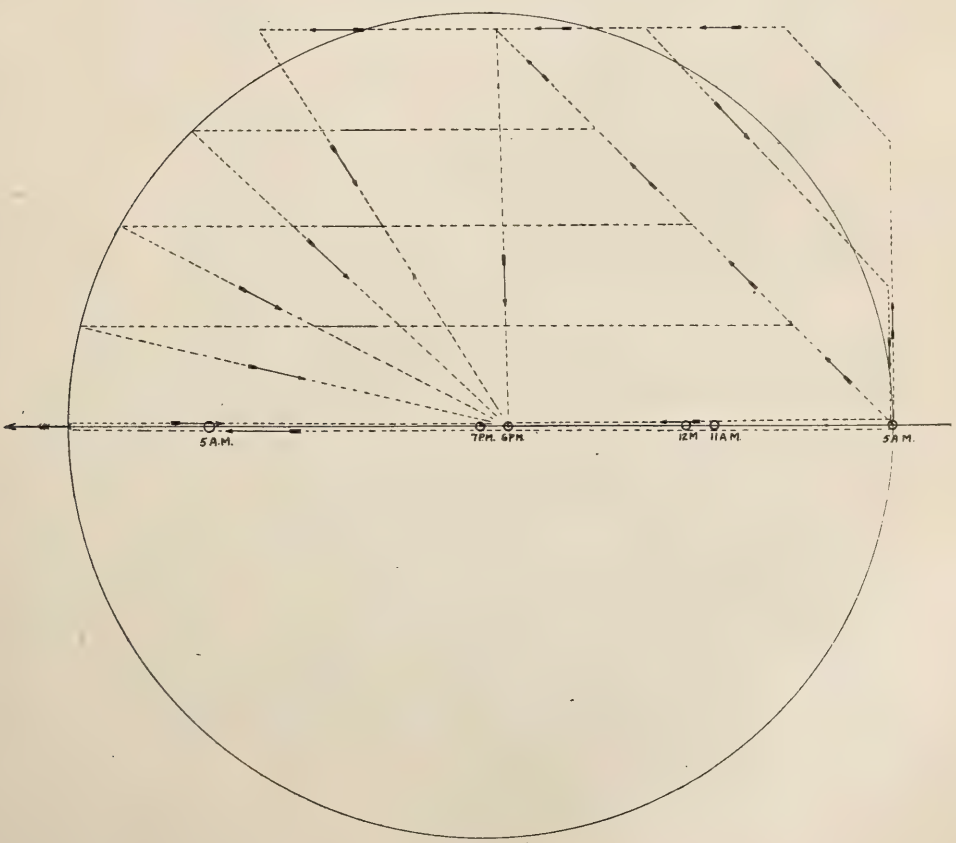


Fig. 13*a*

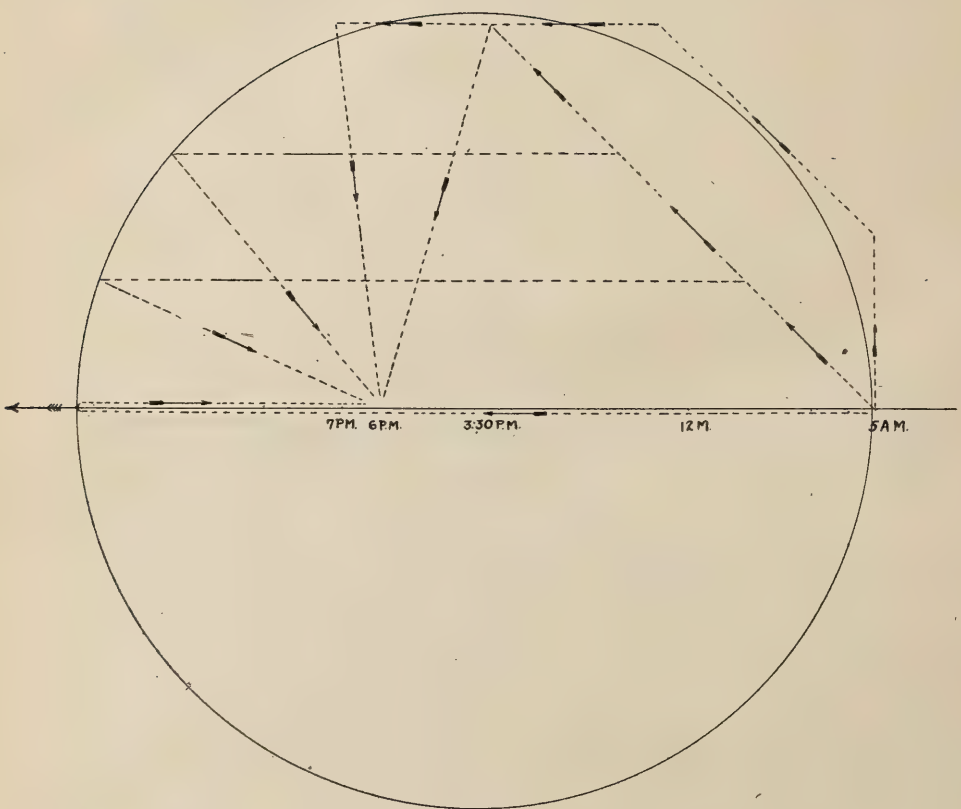


Fig. 13*b*

(Figure 13B.) Carrying the reduction of speed still further, to 30 knots, the number of airplanes necessary becomes 9, but it will not be known before 3.30 that no attack can be made from any direction before 7 p. m. by vessels making 25 knots or less. The airplanes are indicated returning to the 6 p. m. position of the convoy.

(Figure 14.) The usefulness of the airplane with an endurance of 850 miles brings in the question of the fleet seaplane. Returning to the case of the convoy leaving Cape Henry for the fleet in the vicinity of Culebra, figure 14 indicates in black lines the day's run of the 20-knot scouts searching for the convoy. Assuming a 70-knot fleet seaplane with a radius of vision of 25 miles, five seaplanes will scout a belt 250 miles wide, clear to the coast of the United States and would finish the search by 5.15 p. m. The increase in the areas covered is, of course, very great.

Figure 15 shows that a fleet seaplane making 70 knots an hour for 14 hours, or 980 miles a day, and being able to keep this up for two days, making 1,960 miles. This flight would enable the seaplane to fly from Bermuda to the American coast at Cape Hatteras, skirts the coast to the eastern end of Long Island, rest for the night 30 miles out at sea and return to Bermuda next day, and still be 400 miles within the limit of endurance.

(Figure 16.) With two battle fleets in the same theater scouting with fleet seaplanes we have a very reasonable supposition. Assuming 70 knots speed for the planes and 20 knots for the battle fleets, figure 16 illustrates that nine planes will cover all possible approaches of the enemy during one day's operations. Let the fleet be steaming along the line AE. If the planes get away at 5 a. m. and return to the 6 p. m. position of the fleet, the last will arrive about 2 p. m., having covered about 620 miles. Should it be known that the enemy can not approach from any point east of NS, seven planes will cover the entire area affected, assuming that the fleet continues to the 7 p. m. position.

If the fleet is not continued on its course along AE, but changes toward the enemy if he is sighted, the limit of useful scouting for the day is extended. There is no use in scouting beyond D for that day, since both fleets approaching C will meet there at 7 p. m. The time taken for the scout to reach D is $6\frac{1}{4}$ hours. If a scout proceeds to F and sights an enemy there, this should be known in the fleet at 11 o'clock, by wireless. Both fleets then heading direct for each other should bring them together at 7 p. m. The limit of useful scouting for the day seems to be about 6 hours. In fact, on the NS line, G is the limit, 400 miles, and the distance becomes less as the angle DAF increases. This assumes that the enemy will also take the most favorable course in order to make contact. This also indicates that about 12 hours endurance is necessary for the scouting for the day's operation of the fleet.

It will be poor economy to use the fleet seaplane for scouting waters that can be covered with the short-distance reconnaissance plane. A combination of the two, a morning and afternoon flight of short-distance reconnaissance planes while the fleet seaplanes scout outside of them would be more satisfactory.

Scouting at sea will require the airplane to be carried on vessels except for the fleet seaplane. Since attempt will be made by each belligerent to take possession of the air as a preliminary to battle and during battle, there can be no question but that the problem of furnishing airplanes of different types in quantities must be faced. The presence of large numbers of airplanes in addition to the fighting, spotting, and short-distance reconnaissance planes carried by the fighting ships themselves will necessitate the airplane carrier. In fact, it is believed that the fighting ships will not carry airplanes if carriers are supplied in sufficient quantities. It can be seen readily that it will be very inconvenient to say the least to have a battleship in formation lose her position in order to pick up an airplane, if leaving formation for this purpose could be contemplated. When the weather is too heavy to use the airplanes to advantage, reliance must be had, for information, on scouting by surface craft. Except in unfavorable conditions, distances can be covered so quickly and the areas covered are so much larger than can be scouted by surface craft that the possession of the airplane for these purposes is vital. The airplane will be made reliable as was the automobile, and it can be easily seen that scouts without airplanes might be of very little value when opposed to an enemy that has them. Also it is seen that the fighting vessels of the fleet may be kept concentrated for battle while the scouting for information is done by aircraft. When contact is made, a fleet so organized will have a tremendous advantage over one whose battle cruisers and scouts are scattered for the purpose of obtaining information of the enemy.

In the foregoing examples of the probable use of the airplane the need for a plane with an endurance between that of the short-distance reconnaissance plane and the fleet seaplane is apparent. Very often it will be desired that the maximum distance possible during one daylight be made, and the measure of efficiency of the airplane will be this distance. It is a natural unit of measure for surface craft and no doubt will be also for aircraft. The gap between the short-distance reconnaissance plane and the fleet seaplane is too great. If we had a short-distance reconnaissance plane, about 450 miles; then the one-day plane, about 1,000 miles; and the fleet seaplane, two days of 12 hours each at 70 knots; the gap would be filled and all possible combinations up to the limit of endurance of the fleet seaplane could be made economically. For instance, referring to figures 4 and 5, where flights are made by two sets of planes, one in

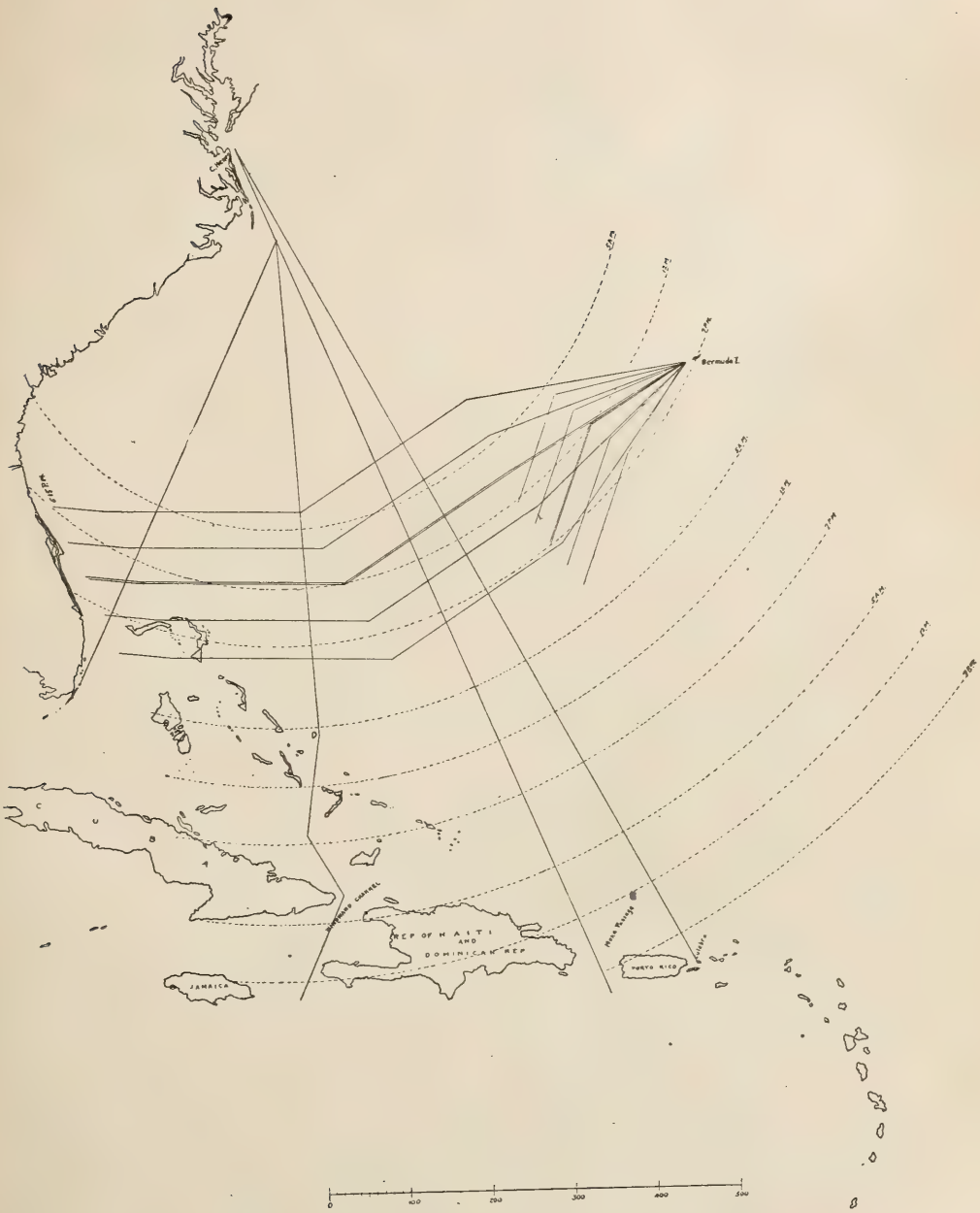

Bermuda I.
JAMAICA
REP OF HAITI
AND
DOMINICAN REP
PUERTO RICO
0
100
200
300
400
500

Fig. 14

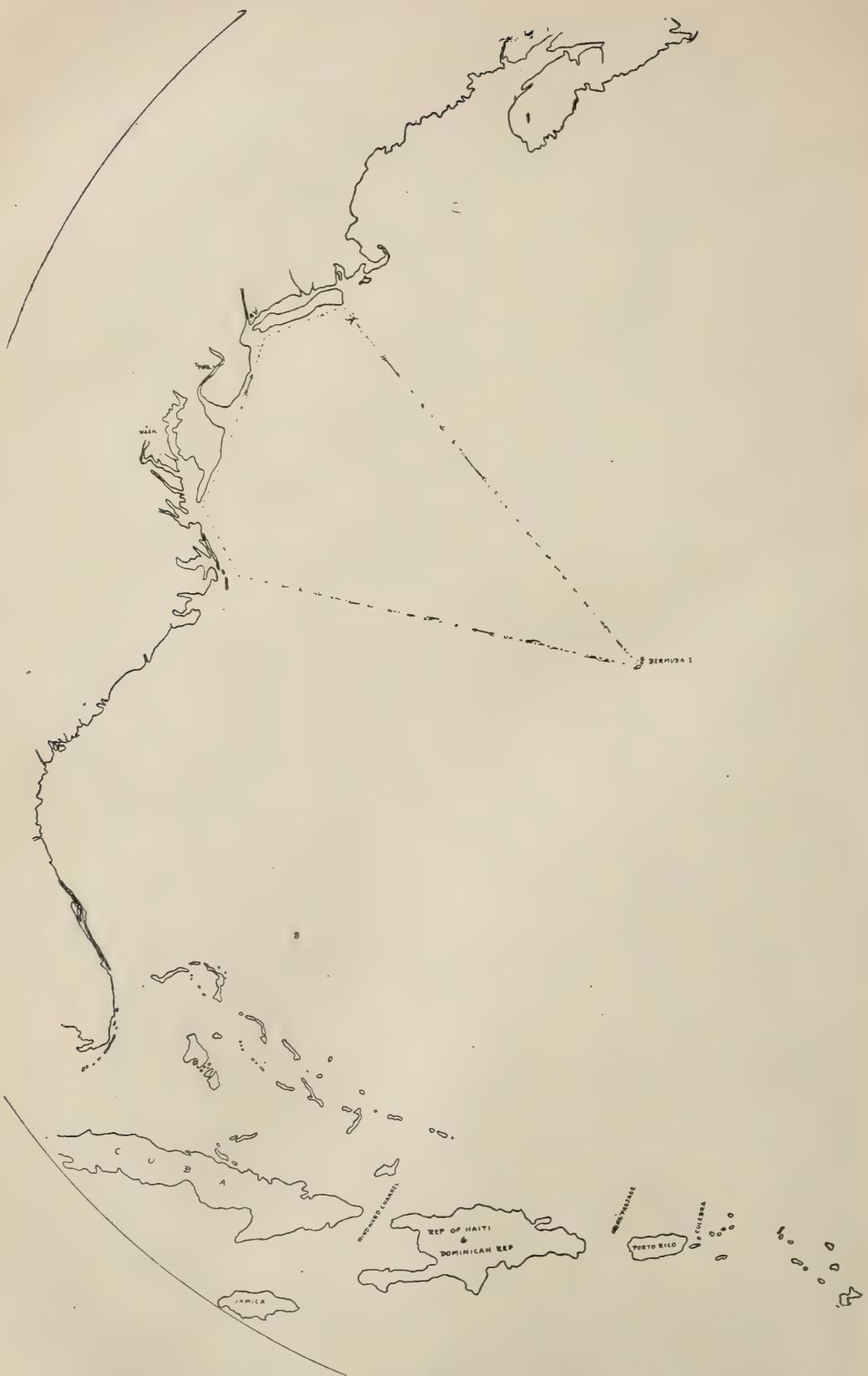

BERMUDA I
WINDWARD CHANNEL
REP OF HAITI
&
DOMINICAN REP
PUERTO RICO
JAMICA

Fig. 15

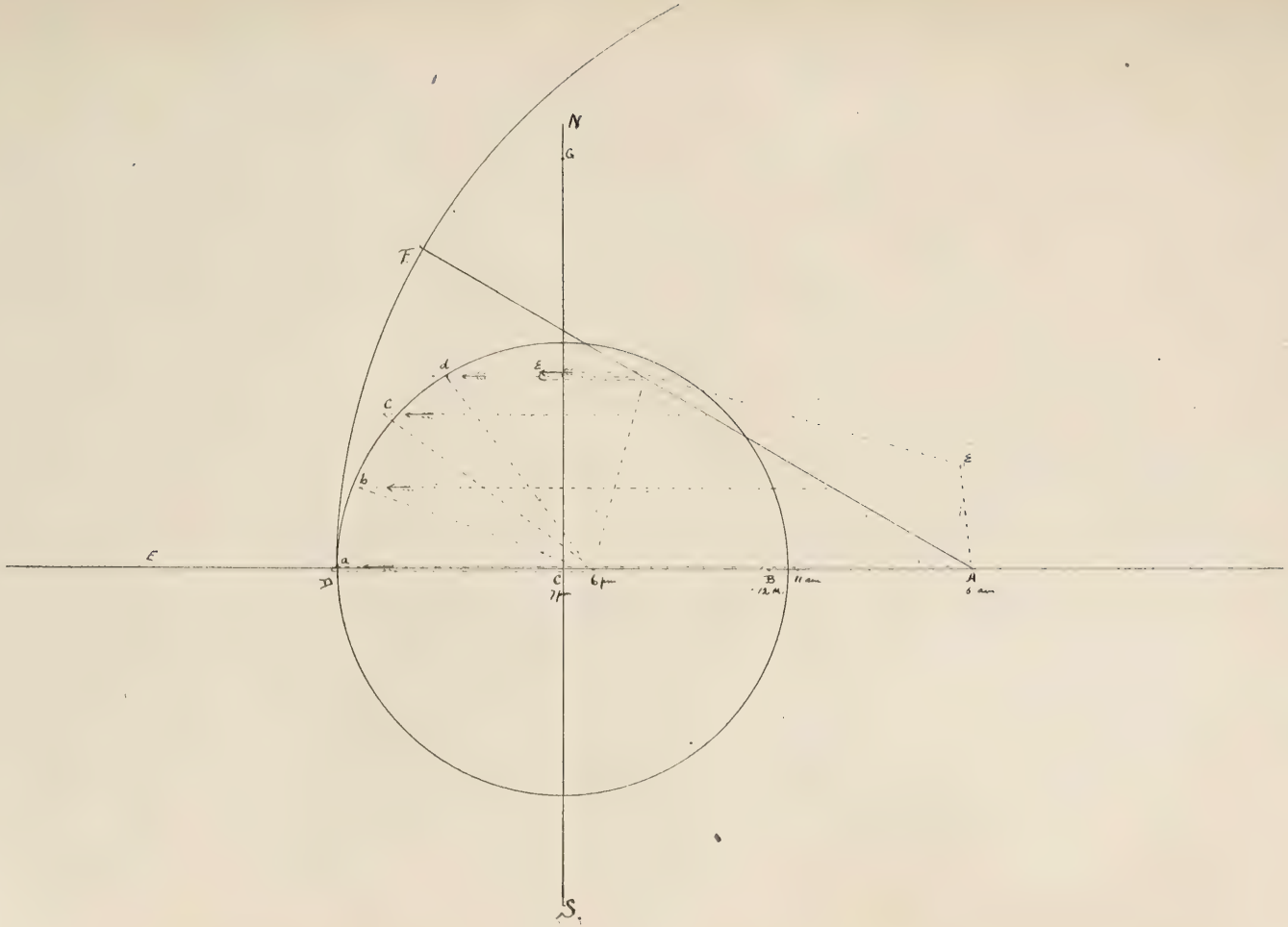


Fig. 16

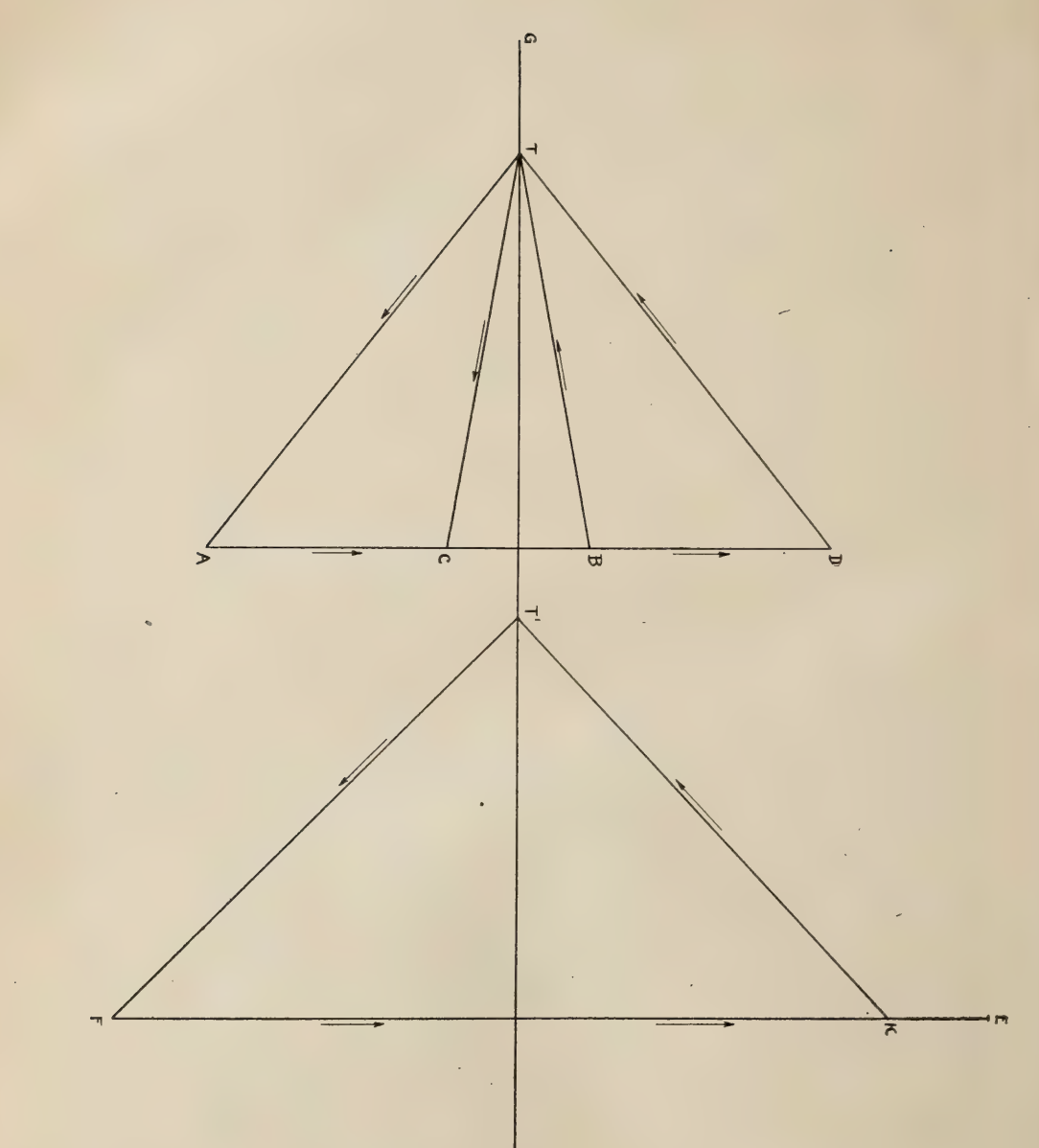


Fig. 17

the morning and one in the afternoon, the whole 24-hour run of the enemy could be covered by one flight of a one-day plane. (See figure 17.) In this case, the flight back to T at the end of the forenoon and from T to the north and south line in the afternoon would be saved. Under the same assumptions, the distance covered would be 757 miles for the outer airplane instead of two flights of 454 miles each.

Comparison between Scout Cruiser and Airplane.

In order to make a comparison between the airplane and the scout cruiser for reconnaissance, a few examples of the use of the two in the solution of the same simple problems will be given.

So long as the distances to be covered are not beyond the endurance of the plane, short-distance reconnaissance or fleet, and a shore base or bases are available, the scouting may be done by airplane alone. If the scouting to be done is beyond this distance, such as finding the enemy in the middle of the Atlantic or far out in the Pacific Ocean, the airplane carrier from which the planes can operate becomes a necessity. If the carrier is not supplied, reliance must be placed on surface craft, supplemented by a few planes flying from each of a number of ships.

The airplane alone can not replace surface craft. This is true whether on patrol or observing a line in any way, or searching or whether the scouting is done in the service of a fleet or convoy in passage. In this latter case the area to be scouted moves with the fleet or convoy and the planes must fly from a moving base.

It is difficult to disassociate entirely the idea of force from the scout. Reconnaissance in force may be the only means for obtaining the required information, and there are times when ability to maintain station in the face of the enemy is of great importance. However, for reconnaissance alone, leaving out the idea of force, it can be shown that a certain number of airplanes of certain types can do the work of ten scout cruisers under certain conditions. Reasonable assumptions must be made and then it must be understood that the airplane will perform in war as it does on paper. The different problems can then be worked out.

There are certain duties that may be performed by the scout cruiser that can not be expected of the airplane. For instance, it may be contemplated that a scout be placed in the Strait of Malakka for observation, and remain there for weeks, with Guam the nearest base. This duty could not be performed by aircraft. Conversely, aircraft can perform duties beyond the capabilities of the scout cruiser. In any case in which it is required that distances be covered at speed beyond the capability of the scout cruiser but within that of the airplane, this is true.

With the airplane carrier the usefulness of the airplane is increased enormously, in fact the carrier is indispensible. The airplane carriers

have other duties besides those of reconnaissance, as well as the scout cruiser. For the airplane carrier in addition to the reconnaissance plane, handles the fighting and bombing plane.

It will be assumed in the following examples that the radius of visibility of the airplane and the scout cruiser is the same, and the maximum will be taken at 30 miles.

Radius of visibility:		
For airplane	miles	30
For scout cruiser	do	30
Speed:		
Short-distance reconnaissance plane	knots	100
Fleet seaplane	do	70
Scout (maximum, 35)	do	30
Airplane carrier (maximum, 35)	do	30
Battle fleet	do	20
Endurance:		
Short-distance reconnaissance plane	miles	450
Fleet-seaplane	do	1,750

Figure 18 shows the lateral distance at which a short-distance reconnaissance plane can operate from a carrier sweeping to the front as shown, the carrier keeping ahead of the fleet. The maximum distance laterally for the plane is 90 miles. Adding 30 miles for radius of visibility, 120 miles is covered. This shows that while the fleet seaplane may make its distance continuously for a flight up to its limit of endurance, a plane flying from a carrier may be making only the speed to the front of the carrier. In this case, 100 miles of flying is expended in reaching the scouting line, 200 miles are then expended in useful flying, and 100 miles is taken up by the return to the carrier. Only 50 per cent of the endurance is utilized.

Figure 19 (*a*) illustrates the scouting of two airplane carriers with airplanes in front of the fleet according to the system described in the preceding paragraph. In order that the enemy's fleet approaching at 20 knots may be picked up in two flights, it is necessary for the airplane carrier to delay at *p* for two hours. Otherwise the enemy will not have approached closely enough and the second flight will fall short. Three flights would require a number of airplanes beyond the carrying capacity of the airplane carrier.

In addition the scouting line must be advanced as shown, the position of the airplane carriers at daylight being five hours steaming for the fleet to the front. This shows plainly the disadvantage of small endurance in scouting where large distances are to be covered. If it should be assumed that the airplane carrier herself is a scout and covers a sector 30 miles each side of her course, it might be thought that the area scouted would be 60 miles wider, the outer airplane being pushed out 30 miles. This is beyond the capacity of this airplane to get results by this system, for 1.2 hours will be consumed in

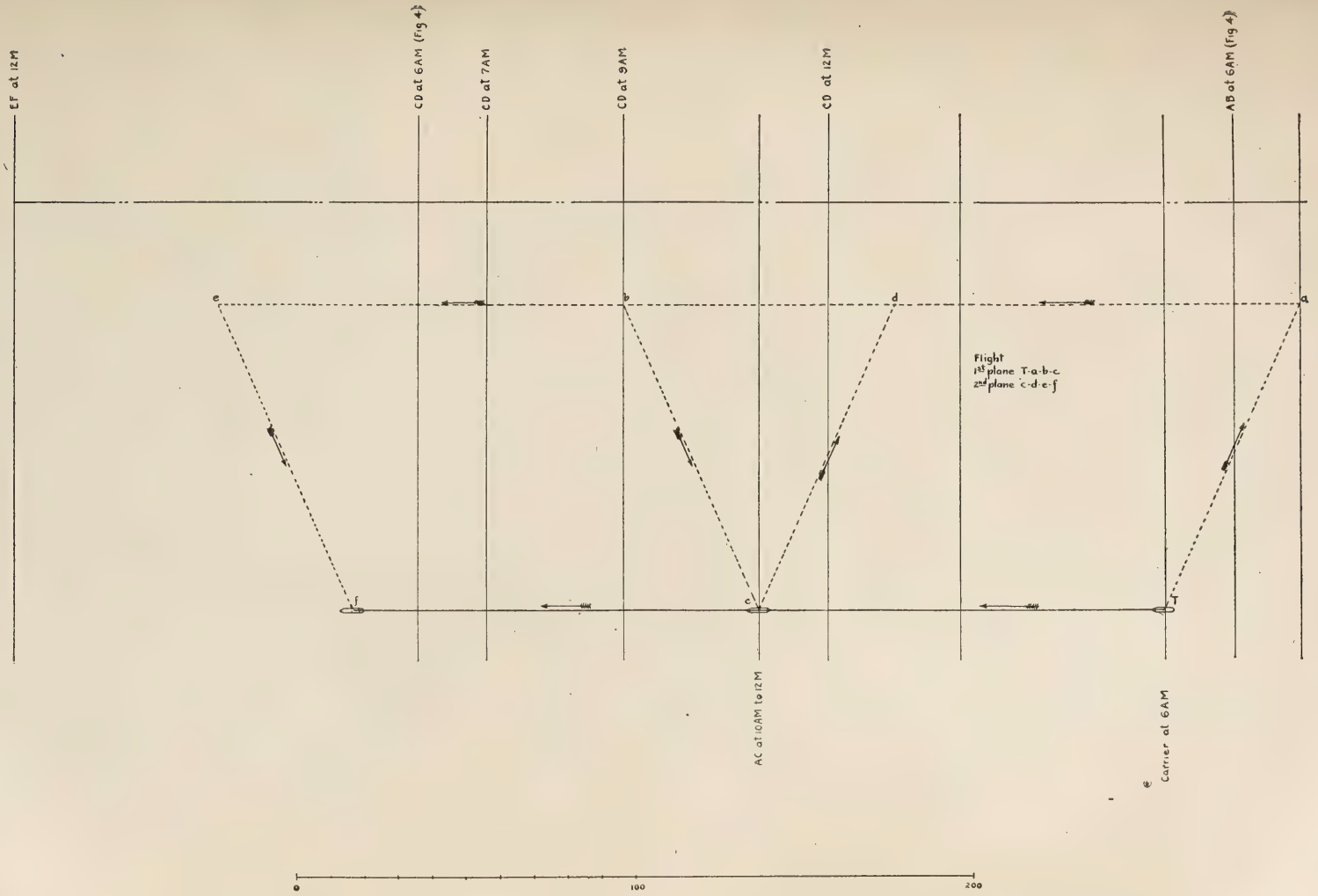

EF at 12M
CD at 6AM (Fig 4)
CD at 7AM
CD at 9AM
CD at 12M
AB at 6AM (Fig 4)
e
b
d
a
f
c
Flight
1st plane T-a-b-c
2nd plane c-d-e-f
AC at 10AM to 12M
Carrier at 6AM
0
100
200

Fig. 18

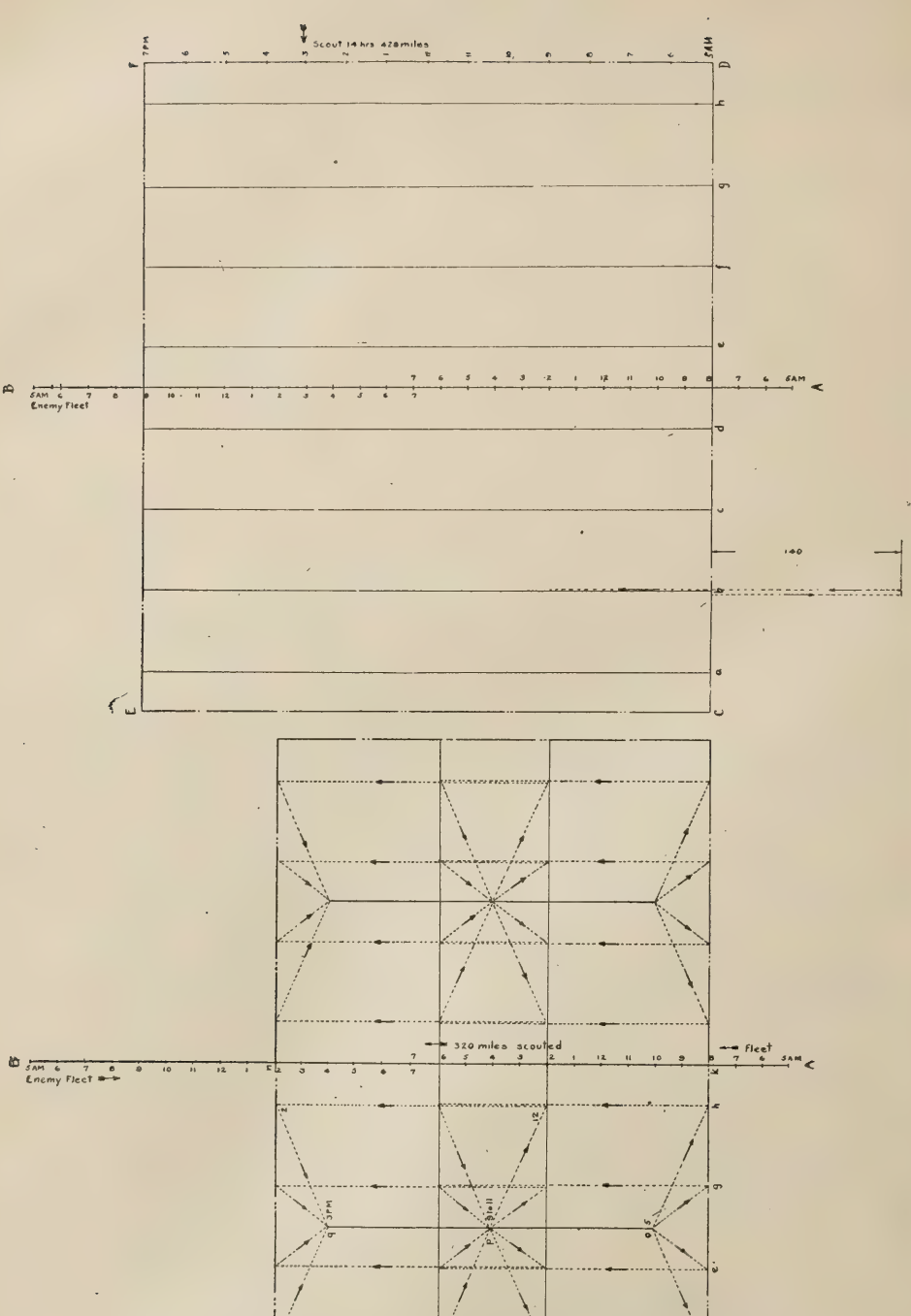

(b)
Scout 14 hrs 428 miles
7PM
6AM
Enemy Fleet
140
(a).
320 miles scouted
Fleet
Enemy Fleet

Fig. 19

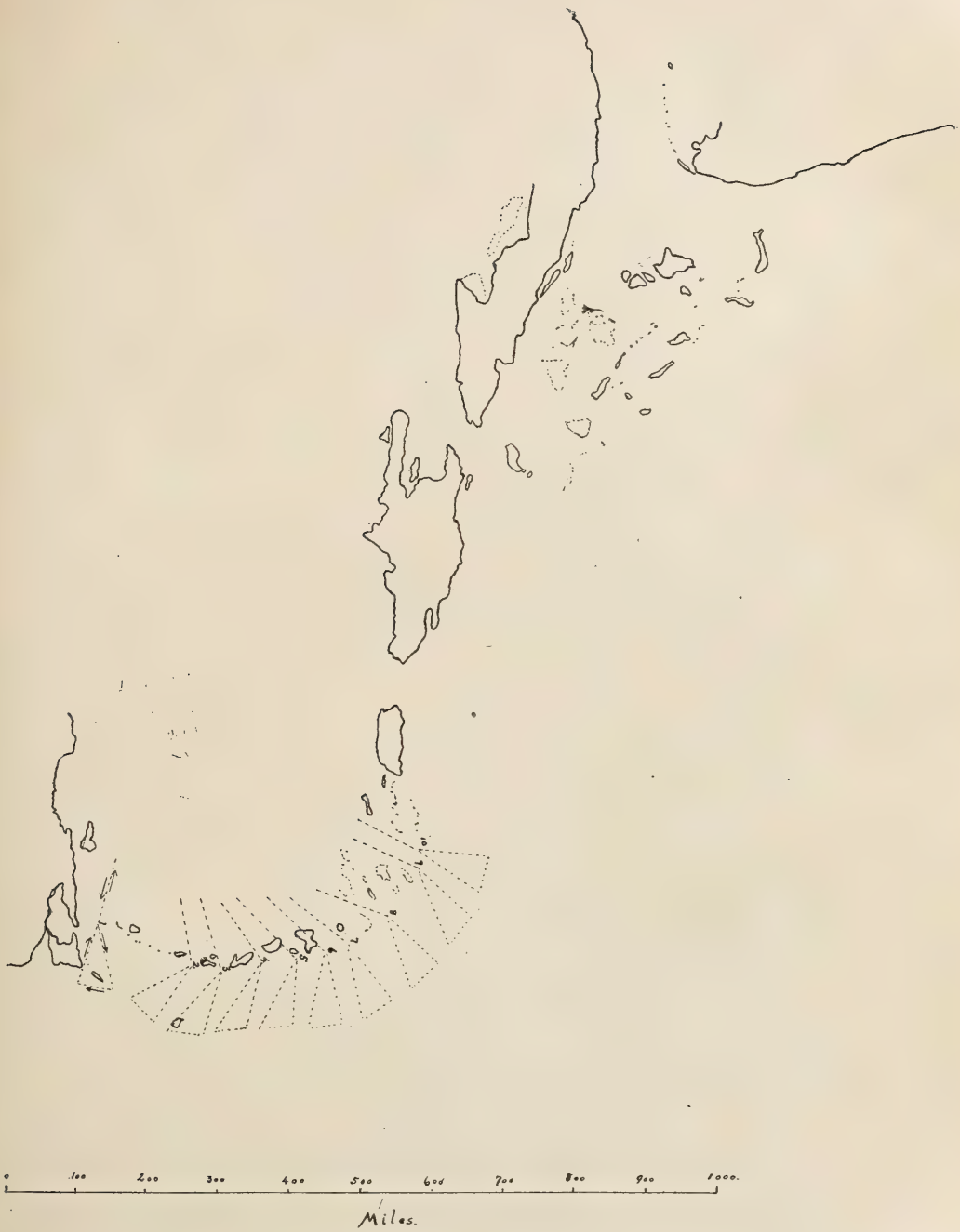


Fig. 20

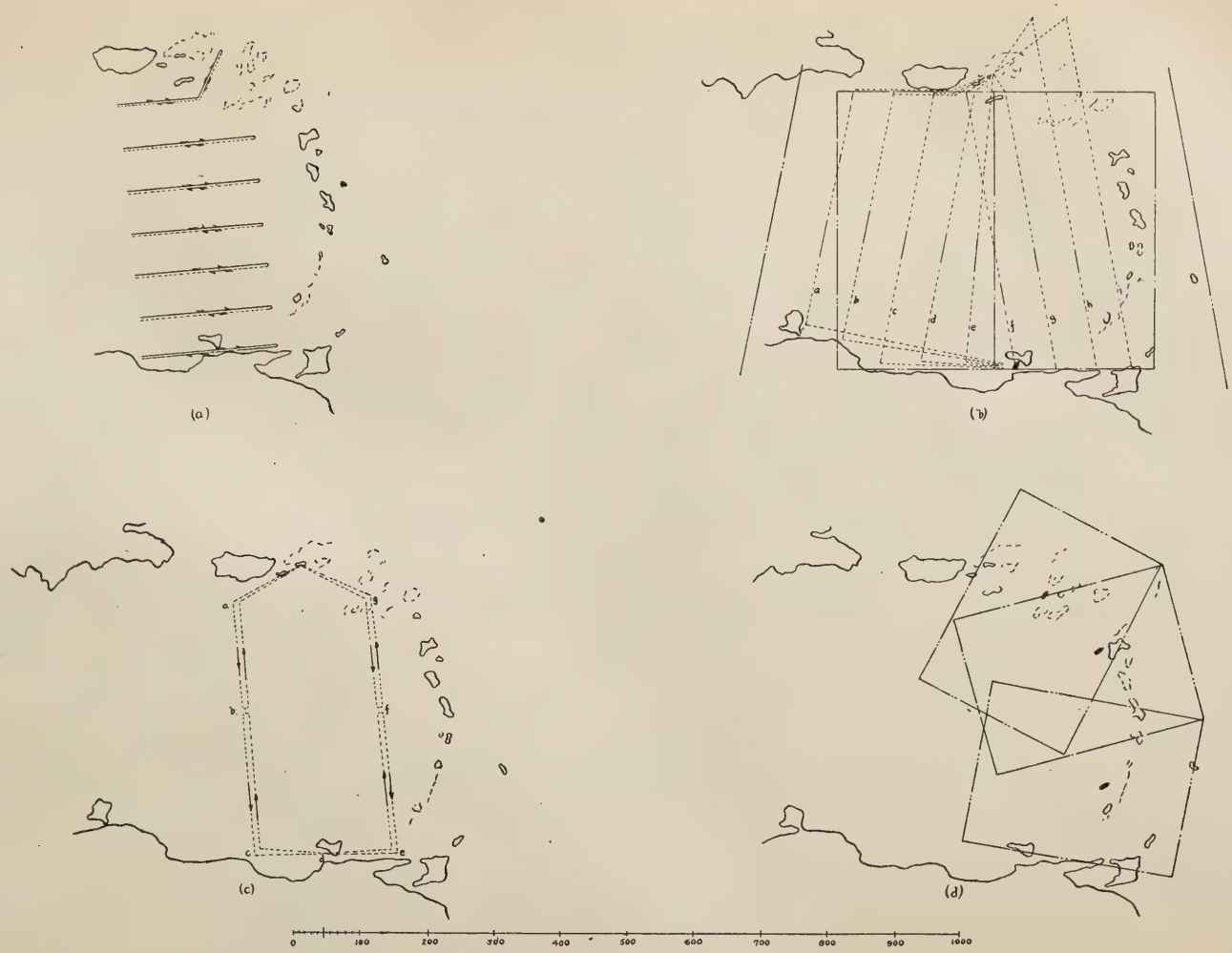


Fig. 21

arriving on the scouting line, 1.2 hours on the return, leaving only 1.6 hours useful flying of the total 4 hours available. This renders a third flight necessary, and too many airplanes are required. With the enemy's fleet at the maximum distance from which contact can be made between the two fleets by 7 p. m., the scouting line would be in contact with the enemy fleet at 2 p. m. With planes flying in pairs, two carriers with 16 planes each are used; adding 50 per cent for replacement, two carriers with 48 planes are required.

Figure 19 (*b*) is the same width covered by scout cruisers. Should the line of 8 scouts start abreast the fleet at 5 a. m., contact would be made shortly after 4 p. m. Starting the same distance to the front as is shown in (*a*), contact will be made at 3 p. m. By a flight of short-distance reconnaissance planes to the rear, as shown by the dotted line at the bottom, the scouting line could be thrown 140 miles to the front, and contact would be made at 11.30 a. m. If flights are also made to the front contact could be made earlier still.

Figure 20. A reasonable problem would be the observation of all passes from the Atlantic Ocean to the Caribbean Sea. The Straits of Florida could be observed by air or surface craft or both, operating from Key West and Havana, the Windward Channel from Guantanamo, the Mona Pass from Mayaguez, and the Virgin Passage from St. Thomas. Ten scout cruisers disposed in the various passes from the Anegada Passage southward to the north coast of South America should form an efficient screen. The possession of one or more reconnaissance planes by each scout cruiser adds greatly to their effectiveness, for a morning and evening flight should be made along the most probable line of advance of the enemy, covering the night run through the passes, assuming that this would probably be attempted.

Figure 21 (*a*) shows the line from St. Thomas to the South American coast covered by 7 scout cruisers that advance and retire 200 miles.

Figure 21 (*b*) shows the area swept by 9 fleet seaplanes flying from St. Thomas and Margarita as shown. The distances flown are from 440 to 880 miles. Nine per diem, flying every other day, with 50 per cent for replacement, makes a total of 27 planes and one airplane carrier. Should the duty continue for only two or three days some of these planes might fly on successive days.

Figure 21 (*c*) shows a double patrol line of fleet seaplanes. The required flight is 600 miles. Five flights in pairs for each sector renders 40 planes a day necessary, which with 50 per cent for replacement gives 60 planes and one airplane carrier necessary.

Figure 21 (*d*) shows the line covered farther to the front than is done in (*c*) on the system shown in figures 4 and 5. Total, including replacements, 3 airplanes carriers with 72 short-distance reconnaissance planes, assuming that the planes fly on successive days.

Figure 21 (*c*) shows a double patrol line of fleet seaplanes. The required flight is 600 miles. Five flights in pairs for each sector renders 40 planes a day necessary, which with 50 per cent for replacement gives 60 planes and one airplane carrier necessary.

Figure 21 (*d*) shows the line covered farther to the front than is done in (*c*) on the system shown in figures 4 and 5. Total, including replacements, 3 airplanes carriers with 72 short-distance reconnaissance planes, assuming that the planes fly on successive days.

Figure 22 shows the same area covered as in figure 21 (*d*) by using two patrol lines. In addition to the sector covered from St. Thomas, 3 airplane carriers with 30 planes each, total 90, are required.

Summary of paragraphs 35 to 42, figures 19, 20, 21, 22.

	Scout cruisers.	Airplane carriers.	Fleet seaplanes.	Short-distance reconnaissance planes.
Figure 19	8	2	.....	48
Figure 20	[1] 10	.....	.....	.....
Figure 21 (*a*)	7	.....	.....	.....
Figure 21 (*b*)	.....	1	27	.....
Figure 21 (*c*)	.....	1	60	.....
Figure 21 (*d*)	.....	[2] 3	.....	72
Figure 22	.....	3	.....	90

[1] Short-distance reconnaissance planes carried as part of equipment of cruisers.
[2] In order to cover the area to the rear, as is done in figure 21 (*c*), 2 carriers with 48 planes will suffice.

The estimated cost of the airplane carrier is	$23,150,000
Scout cruiser (10,000 tons)	12,200,000
Scout cruiser (Nos. 4–13)	7,500,000
Fleet seaplane	200,000–250,000
Short-distance reconnaissance plane	25,000

In order that the airplane will be able to take over all the duties of scouting possible that are now performed by the scout cruiser, it should fulfill the following conditions:

(*a*) In addition to the short-distance reconnaissance plane and fleet seaplane now designed, we should have a plane with an endurance of about one day.

(*b*) The airplane should have such reliability that no undue waste is incurred in material, and especially in personnel, and sufficient certainty of performance should be assured.

(*c*) That the navigation of the airplane is so developed that it can make good courses and distances as well as or nearly as well as surface craft.

(*d*) That the wind will not exceed 40 or, at most, 50 knots.

(*e*) That the bases, either ashore or afloat, are provided sufficiently close to the areas to be scouted.

(*f*) That airplanes are provided in sufficient numbers (this includes airplane carriers or tenders) that continuous observation of the areas to be scouted is assured.

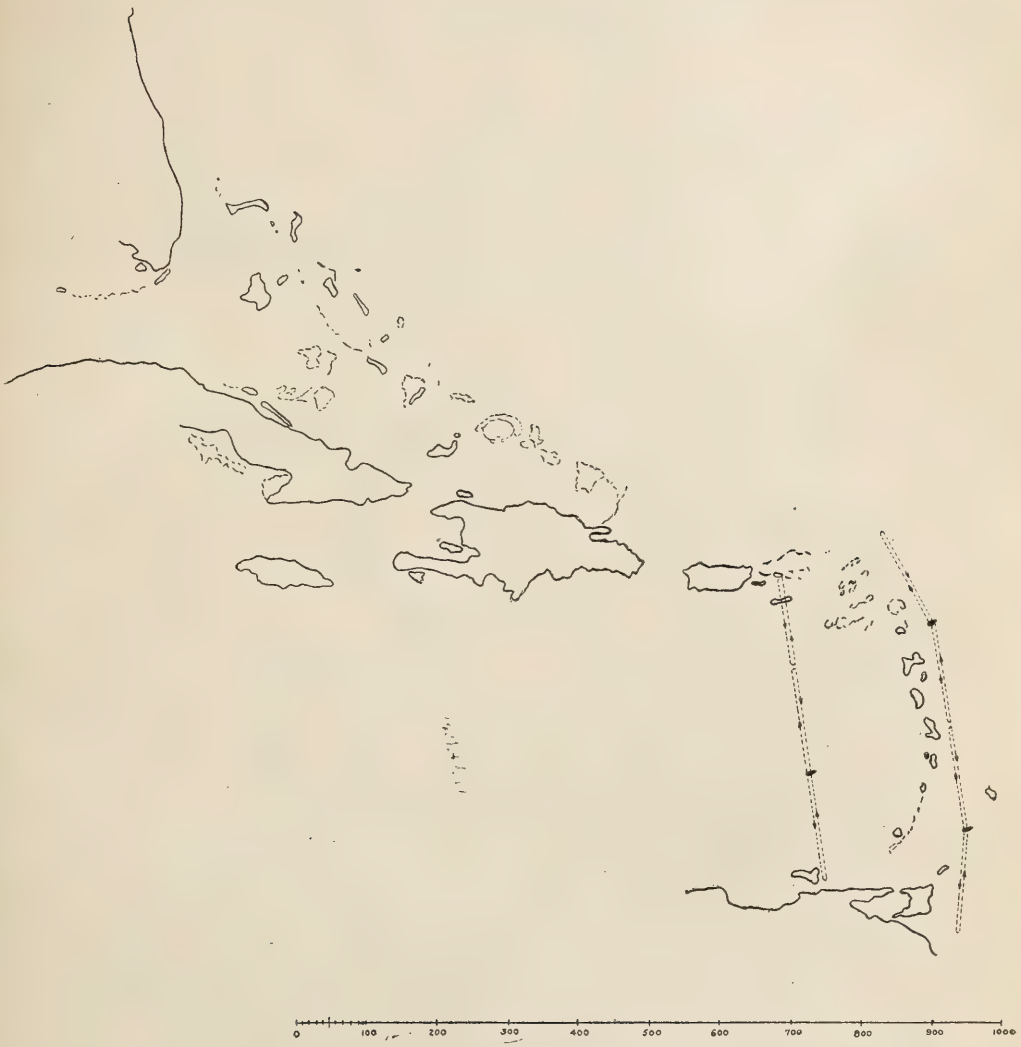


Fig. 22

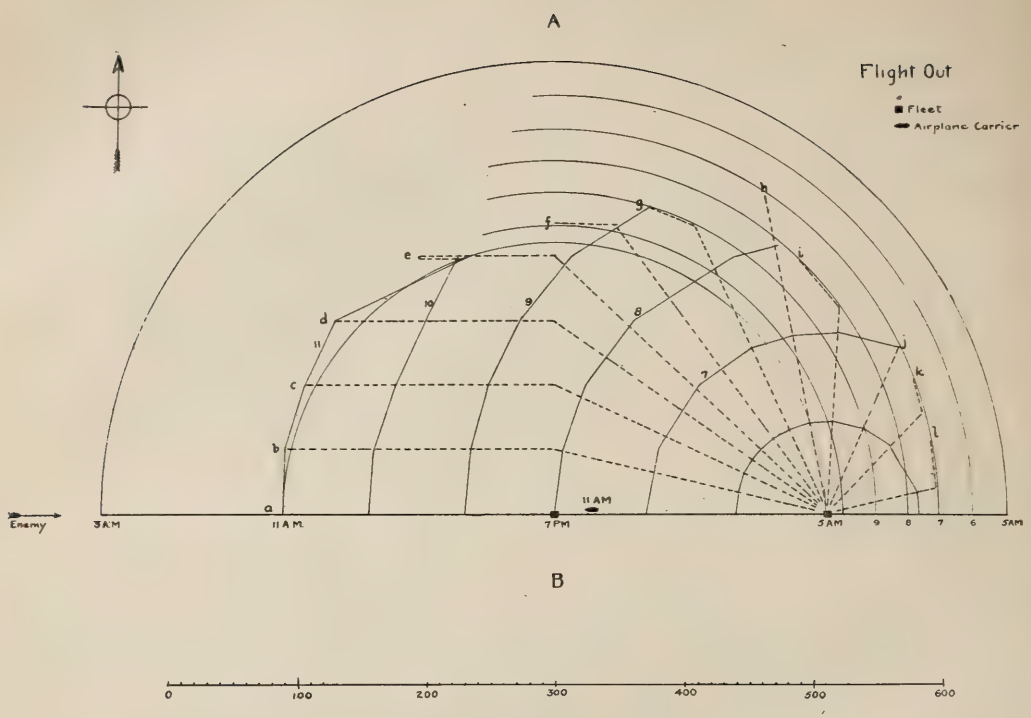

A
Flight Out
Fleet
Airplane Carrier
a
b
c
d
e
f
g
h
i
j
k
l
11
10
9
8
7
11 AM
Enemy
3AM
11 A.M.
7PM
5AM
9
8
7
6
5AM
B
0
100
200
300
400
500
600

Fig. 23

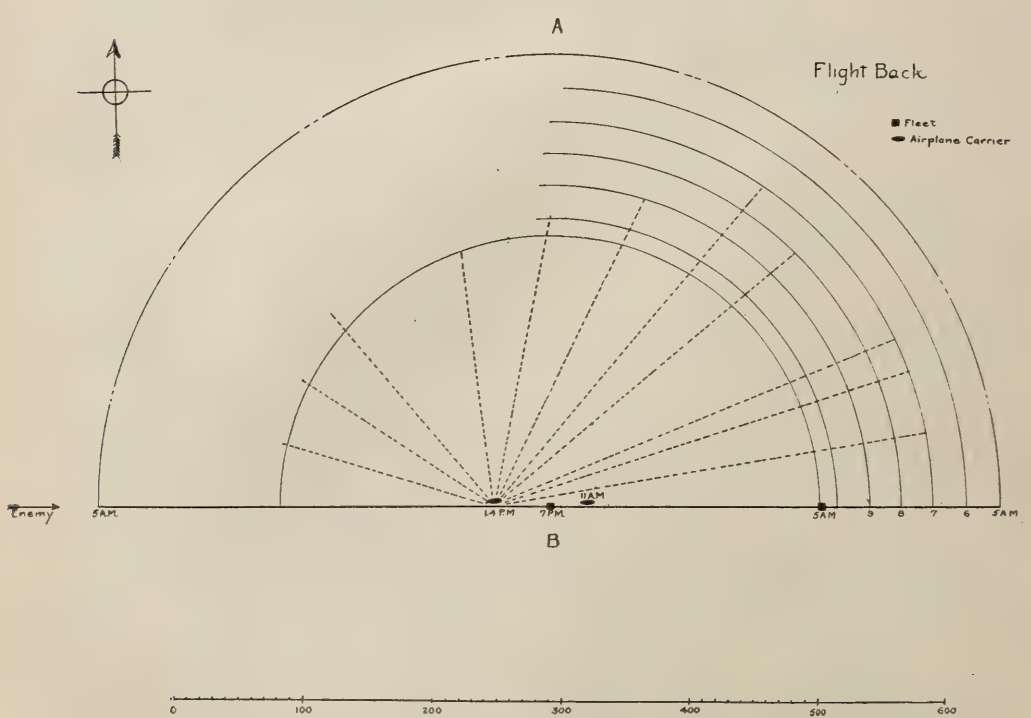

A
Flight Back
Fleet
Airplane Carrier
Enemy
5AM
2 PM
7PM
11AM
5AM
9
8
7
6
5AM
B
0
100
200
300
400
500
600

Fig. 2

(*g*) In the case of the fleet seaplane operating in the open sea, when alighting the waves must not be higher than about 8 feet, and when refueling the sea must be smooth.

(*h*) Such limitations as the practical flyers may know about must be removed.

Unless the questions raised in the preceding paragraph can be answered in a way favorable to the airplane it must be concluded that, for reconnaissance, the airplane can not replace the scout cruiser, but that the airplane is an indispensable element in modern scouting.

Lighter-than-Air.

Kite balloons and nonrigid airships are of value in coast patrol and convoy duties but can not be considered for distant scouting. The rigid dirigible has the necessary speed, endurance, and carrying capacity to be considered the ideal machine for distant scouting. The state of the rigid-airship building industry in this country is very unsatisfactory, to say the least. It can not be expected that here, where preparations are being made to build our first rigid, results can be obtained in any way comparable to those in Europe, where money and energy have been spent for years developing the rigid airship. The characteristics of the rigid to be built by the Navy, showing a maximum speed of 50 knots, cruising speed 37.5 knots, and endurance of 3,000 miles are conclusive as to the ability of the rigid airship to take over the duties of the scout cruiser. The speed and endurance are so low that weather conditions will have too much effect on the performance. When the results obtained in this country are equal to what is now accomplished in Europe the value of the rigid airship for scouting will be greatly enhanced. It may be foretold that mooring out will be successful; that the airship will carry fighting planes for her defense and for attack. The size and efficiency will increase in every way, and the time may come when distant scouting will be performed mainly by airships. It may be that the airship and submarine will do all distant scouting and that attack and defense of rigid airships and airplane carriers will take the place of combats of surface scouts, but that development must come slowly, as the means at hand become available. Should that result be attained, the disappearance of the cruiser, as a scout, will come about naturally, as naturally as the sailing scout was displaced by steam.

1,000-Mile Scouting Plane.

The following paragraphs, on the 1,000-mile scouting plane, are an extension of paragraphs 18, 23, 24, and 27.

Theoretical study of scouting by airplane leads to interesting speculations when problems are taken up that are beyond the capacities of present construction. Without going too far into probable im-

provement, useful study can be made if the march of progress is assumed to be reasonable.

One reasonable desire of a commander in chief in war and one that should be satisfied if practicable is that he be able to start scouting at daylight and cover the area of probable operations for that daylight.

Referring to figure 23, let a convoy, represented by the black square, be proceeding from the position 5 a. m. to the position 7 p. m. at 15 knots. Assuming the enemy to have a speed of 25 knots, he must be within the black circle of 350 miles radius if contact is to be made before dark (14 hours of daylight). With 30-knot airplane carrier and 70-knot airplanes, a plane flying west from the convoy at 5 a. m. would meet an enemy coming east at 11 a. m. The position of the 30-knot airplane carrier would be as shown. Covering the area of possible operations as shown, 11 planes in the upper semicircle, plus 11 planes for the lower semicircle (not plotted), plus one for the middle line (*a*) shows that 23 flights will do the work. With wireless sufficiently powerful, the convoy commander should know by 11 a. m. whether he can be molested before nightfall. Figure 24 shows the flights back to the airplane carrier at her 1.4 p. m. position.

The following Table "A" gives the runs necessary for planes of different speeds from 65 to 110 knots. Columns 4 and 5 are the theoretical distances in a calm. Columns 6 and 7 give the runs with an added factor of safety of one-seventh.

"A" Scouting for Day's Run (14 Hours Daylight).

(Convoy, 15 knots; enemy, 25 knots; airplane carrier, 30 knots.)

Airplane speed.	Without factor of safety.				With factor of safety.	
	Hours out.	Miles. out.	Total hours.	Total miles.	Total hours.	Total miles.
65	6.2	404	8.5	553	9.7	631
70	5.9	413	8.3	579	9.4	661
75	5.6	420	8.0	600	9.1	686
80	5.3	427	7.8	621	8.9	710
85	5.1	434	7.5	640	8.6	731
90	4.9	438	7.3	657	8.3	751
95	4.7	443	7.1	675	8.1	771
100	4.5	448	6.9	689	7.9	786
105	4.3	452	6.7	704	7.7	804
110	4.1	456	6.5	717	7.5	820

Table "B" gives the distances to be covered assuming the same except that a fleet speed of 20 knots and an enemy fleet speed of 20 knots is assumed instead of 15 and 25, respectively. In round numbers, a plane that will make 70 knots for 10 hours will be required, and this is a very reasonable request for service to make.

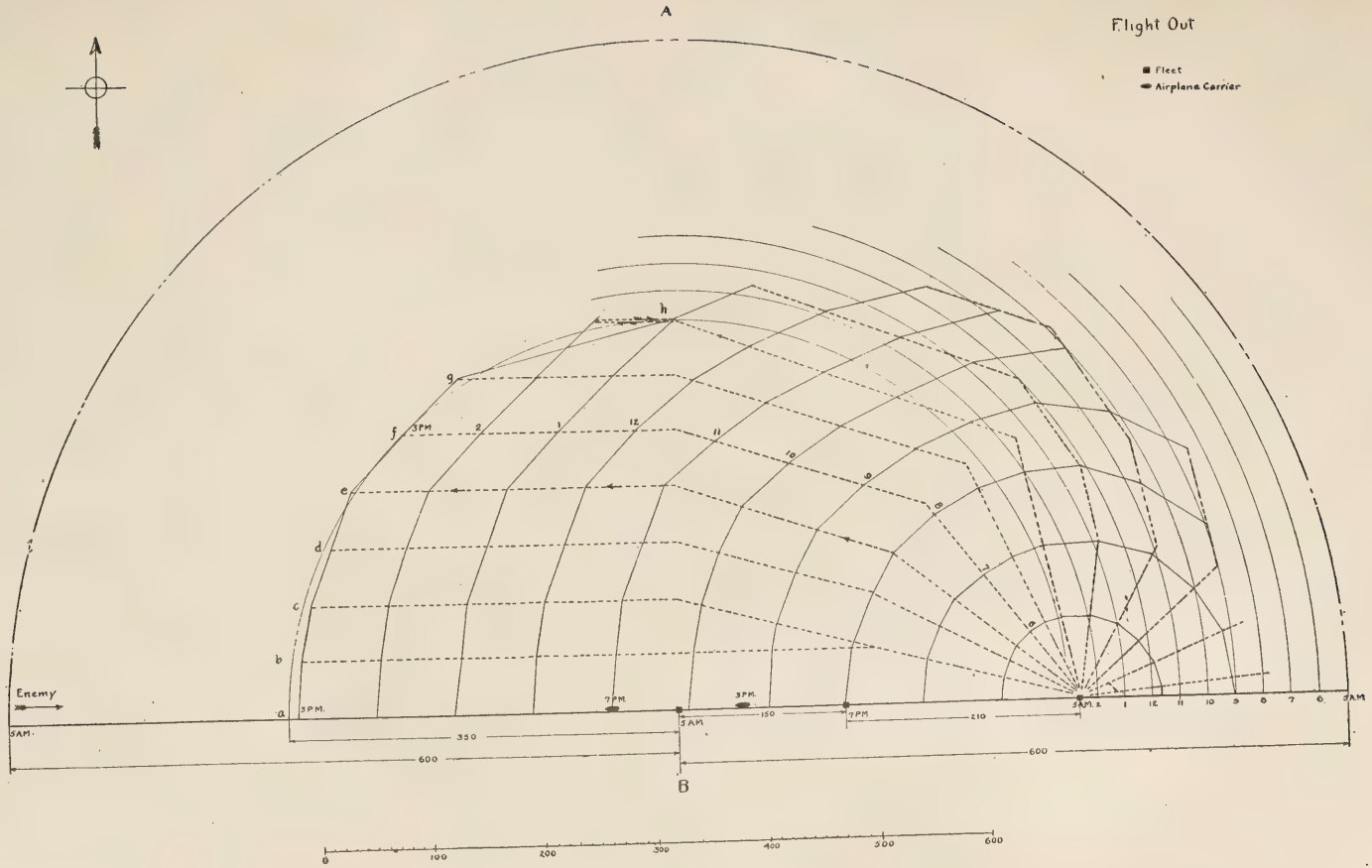

A
Flight Out
Fleet
Airplane Carrier
Enemy
5AM.
5PM.
7PM.
3PM.
3AM.
7PM
3AM.
B
a
b
c
d
e
f
g
h
350
600
150
210
600
0
100
200
300
400
500
600

Fig. 25

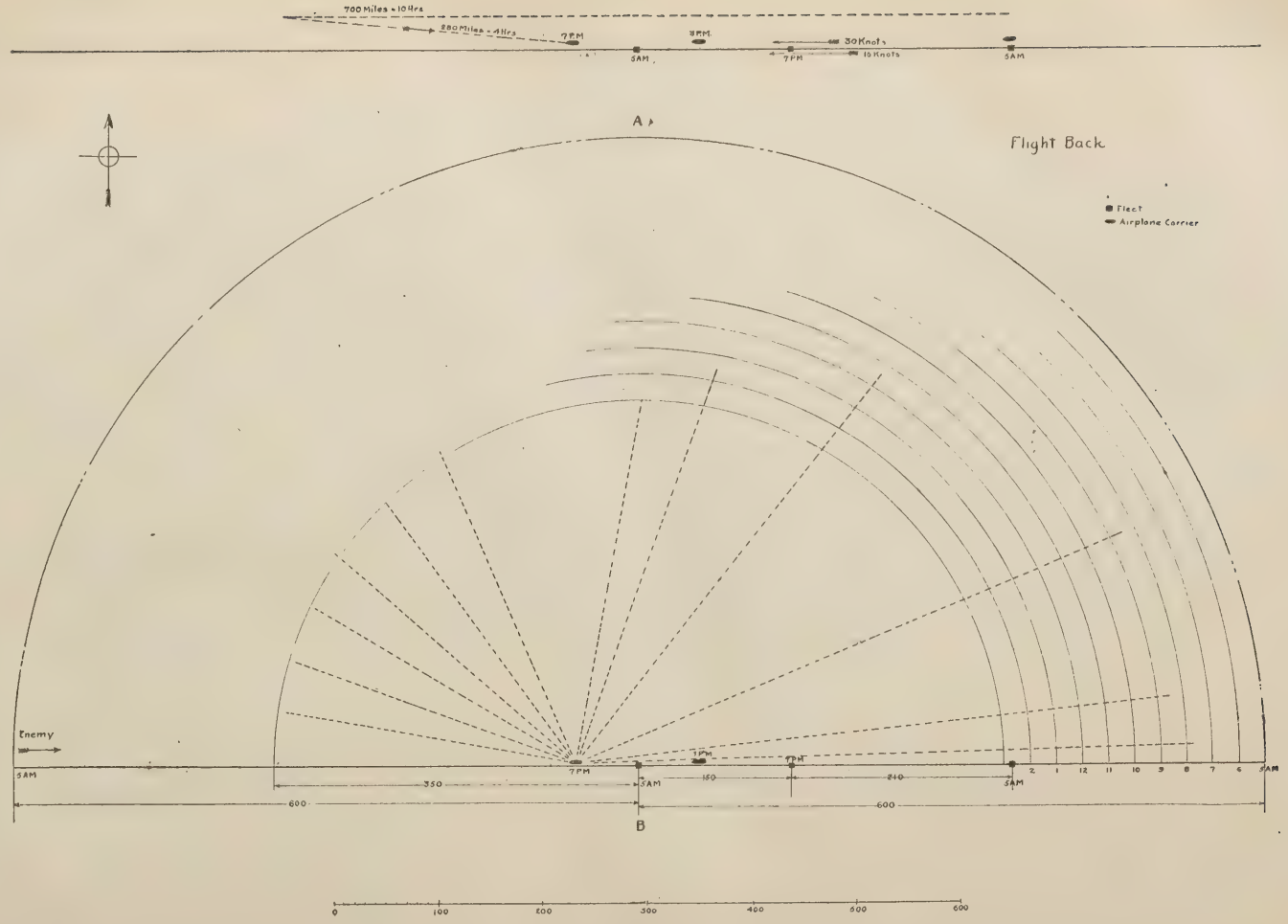

700 Miles - 10 Hrs
280 Miles - 4 Hrs
7PM
3PM
30 Knots
10 Knots
5AM
7PM
5AM
A
Flight Back
Fleet
Airplane Carrier
Enemy
5AM
7PM
1PM
7PM
5AM
2 1 12 11 10 9 8 7 6 5AM
350
3AM
150
240
600
600
B
0 100 200 300 400 500 600

Fig. 26

"B" Scouting for Day's Run (14 Hours Daylight).

(Fleet, 20 knots; enemy, 20 knots; airplane carrier, 30 knots.)

Airplane speed.	Without factor of safety.				With factor of safety.	
	Hours out.	Miles out.	Total hours.	Total miles.	Total hours.	Total miles.
65	6.6	428	8.9	579	10.2	662
70	6.2	436	8.7	609	9.9	697
75	5.9	442	8.4	631	9.6	722
80	5.6	448	8.1	652	9.3	745
85	5.3	453	7.9	670	9.0	766
90	5.1	458	7.6	687	8.7	785
95	4.9	463	7.4	703	8.5	803
100	4.7	467	7.2	718	8.2	820
105	4.5	470	7.0	732	8.0	836
110	4.3	473	6.8	745	7.7	851

Extending the problem, let it be required to know what service is required to cover the area of possible operation for that daylight and the following night. Figure 25 is plotted on the same system as figure 23, the flights out being no more than 50 miles apart. Convoy 15 knots, enemy 25 knots, airplane carrier 30 knots, airplanes 70 knots. Plotting *a* to *h* to arrive on the 3 p. m. circle at the same time, *h* overruns the distance made by *a* by 65 miles, *g* by 45 miles, *f* and *e* by less. Figure 26 shows the flights back to the 7 p. m. position of the carrier; 12 plus 12 plus 1, or 25 planes, are required, and the distance covered is 980 miles to the position marked 3 p. m. The flight out is 10 hours. Figures 27 and 28 plot the flight the full distance to and from the midday circle, and by adding two planes in each semicircle the distances by all flights are no greater than that along the center line. Table "C" gives the calculation for planes of 65 to 110 knots.

"C" Scouting for 24 Hours' Run.

(Convoy, 15 knots; enemy, 25 knots; airplane carrier, 30 knots.)

Airplane speed.	Without factor of safety.				With factor of safety.	
	Hours out.	Miles out.	Total hours.	Total miles.	Total hours.	Total miles.
65	10.7	693	14.6	948	16.7	1,084
70	10.1	707	14.1	990	16.2	1,131
75	9.6	720	13.8	1,036	15.8	1,184
80	9.1	731	13.3	1,064	15.2	1,216
85	8.7	742	12.9	1,097	14.7	1,253
90	8.3	751	12.5	1,137	14.2	1,288
95	8.0	760	12.2	1,155	13.9	1,320
100	7.7	768	11.8	1,181	13.5	1,350
105	7.4	775	11.5	1,206	13.1	1,379
110	7.1	782	11.2	1,228	12.8	1,404

Table "D" gives the figures for speed of two fleets of 20 knots. other elements the same as in "C."

"D." Scouting for 24 Hours, Run.

(Fleet, 20 knots; enemy, 20 knots; airplane carrier, 30 knots.)

Airplane speed.	Without factor of safety.				With factor of safety.	
	Hours out.	Miles out.	Total hours.	Total miles.	Total hours.	Total miles.
65	11.3	734	15.5	1,005	17.7	1,148
70	10.7	747	14.9	1,045	17.1	1,195
75	10.1	758	14.4	1,083	16.5	1,237
80	9.6	768	14.0	1,117	16.0	1,277
85	9.1	777	13.5	1,148	15.4	1,312
90	8.7	785	13.1	1,178	15.0	1,346
95	8.3	792	12.8	1,213	14.6	1,386
100	8.0	800	12.3	1,231	14.1	1,407
105	7.7	806	11.9	1,254	13.7	1,434
110	7.4	812	11 6	1,276	13.3	1,458

Daylight area.—Figure 23 and Tables "A" and "B," 11 plus 11 plus 1, or 23 flights. Flying in pairs and on alternate days, 92 planes will be required. With an allowance of 24 planes to a carrier four carriers will be needed; 70 knots will suffice.

Daylight and night area.—Figure 27 and Tables "C" and "D"; 14 plus 14 plus 1, or 29 flights. Flying in pairs and on alternate days, 116 planes with five carriers will be required. According to table "D," speed of about 100 knots will be needed to bring the time down to 14 hours.

Should it be known that the enemy is approaching from west of AB, in figure 23, the number becomes $(4+4+1)\times 4=36$; two carriers with 36 planes, speeds as great as 90 knots are necessary.

Under the same assumptions on figure 27 $(7+7+1)\times 4=60$; three carriers with 60 planes.

IMPROVEMENT OF AVIATION (JAPAN).

Source: Reliable.

(9318-D)

27 July, 1920.

Measures contemplated by the War Department for the improvement of aviation will be found in AN–2482, which is the War Department budget for the fiscal year 1920. Although this budget has not yet passed the Diet, it will be introduced again into the coming special session of the Diet, and will doubtless be passed. It includes an appropriation of 250,000 yen for the creation of an air board, training of 10 civil airmen per year, and the encouragement of the civil air service. It will be noticed that 115,722 yen is devoted to replenishing air force equipment; for the improvement of the aerial service, 6,206,137 yen, which is to be expended for the establishment of a flight school, the resupply of aeroplanes and the training of addi-

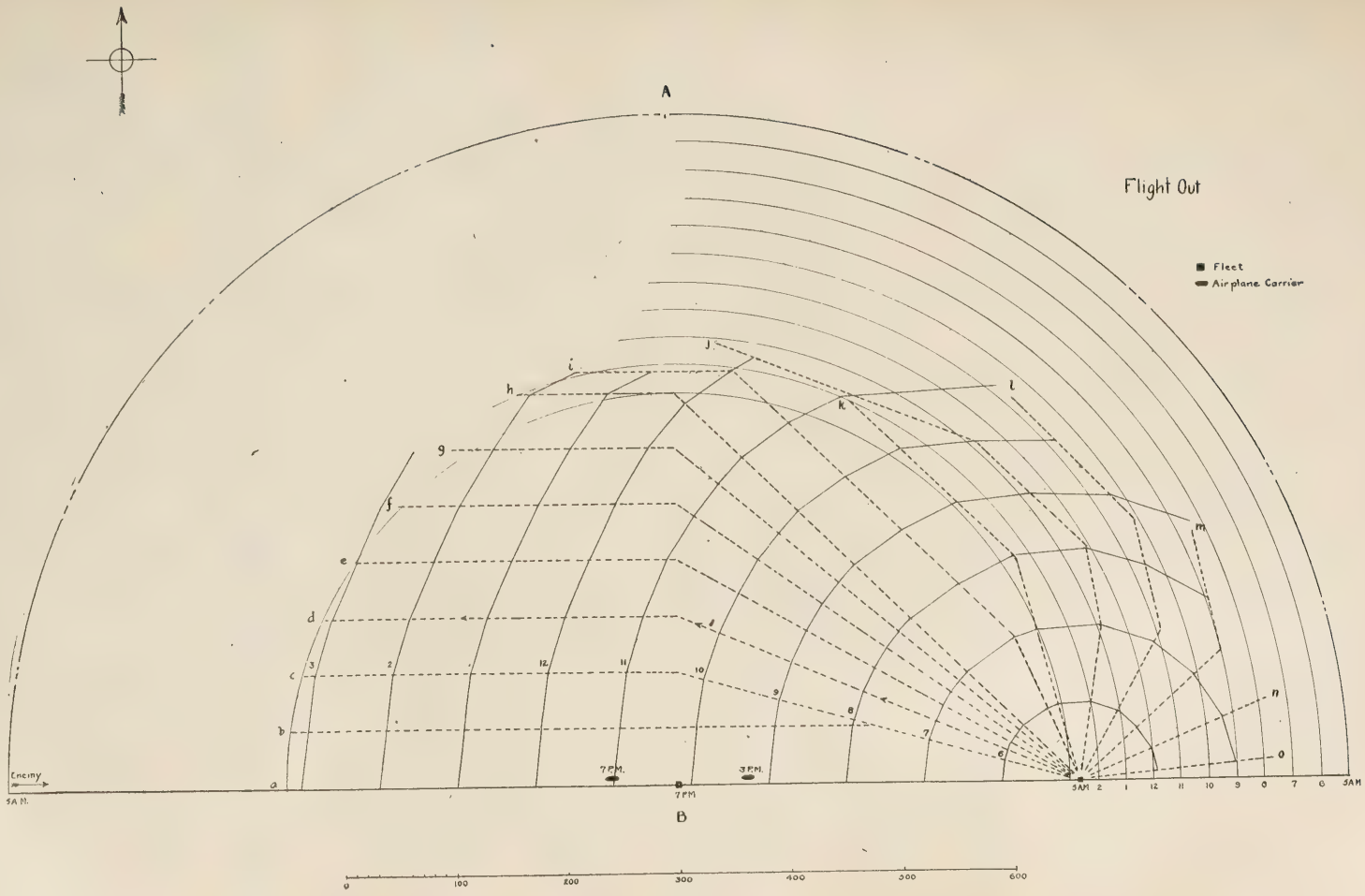
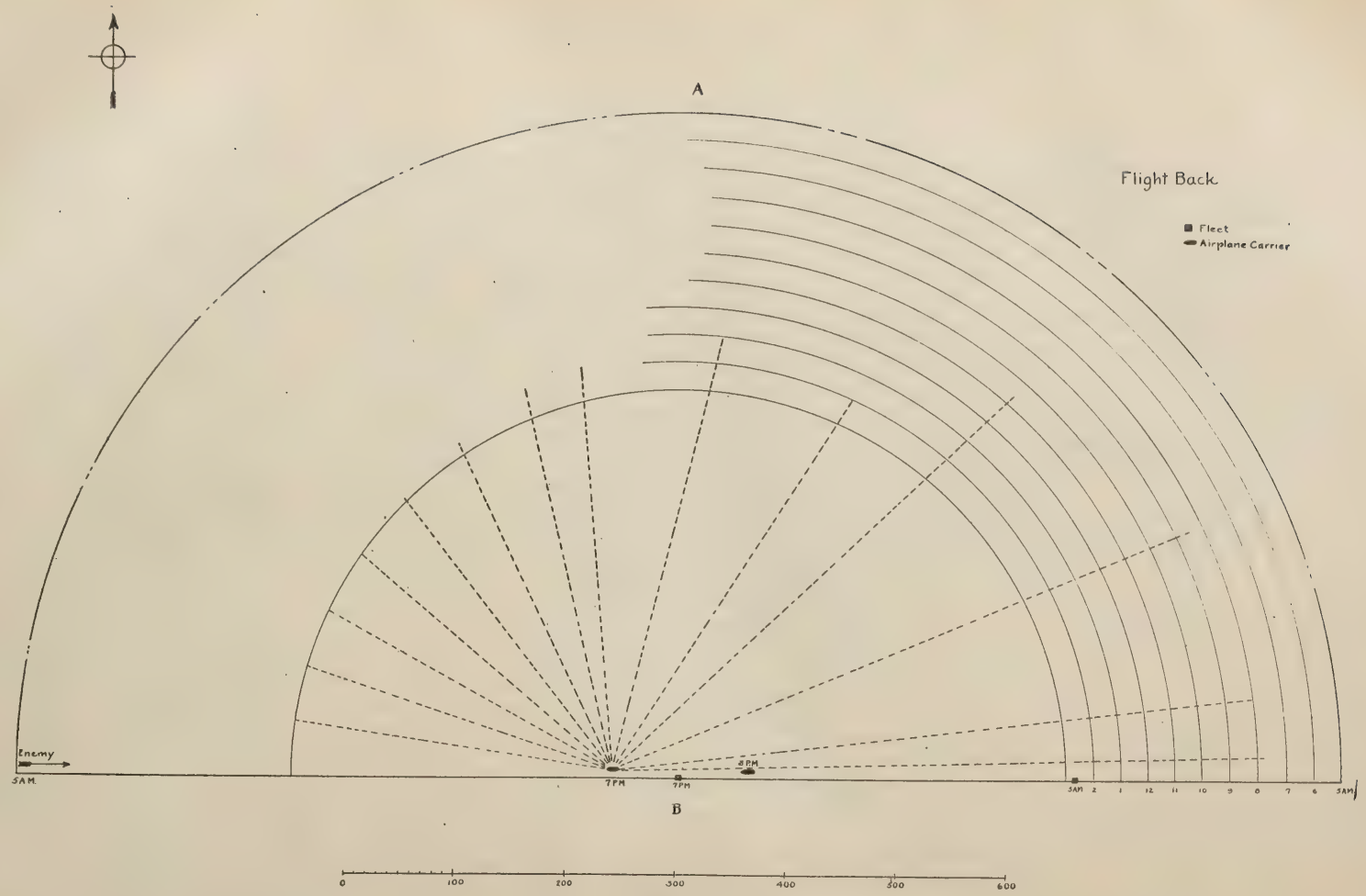

A
Flight Out
Fleet
Airplane Carrier
a
b
c
d
e
f
g
h
i
j
k
l
m
n
o
Enemy
5A M.
7PM.
3PM.
7PM
5AM
B
0
100
200
300
400
500
600

Fig. 27


A
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Airplane Carrier
Enemy
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8PM
5AM
2
1
12
11
10
9
8
7
6
5AM
B
0
100
200
300
400
500
600

Fig. 28

tional experts and mechanicians. For the creation of two new air battalions, there will be appropriated 2,518,562 yen.

The Imperial Aviation Society has for its function the encouragement of civil aviation. In 1918 subscriptions to the society amounted to about 1,250,000 yen, of which the Emperor contributed 500,000 yen. This money is being used mainly as prizes for civilian aviators. It will be recalled that, in the recent nonstop flight to Osaka and return, a prize of 10,000 yen was offered for the winner and 8,000 yen for second place. Even with these generous prizes there were only two entries, one of whom fell and was seriously injured. At a recent meeting of this society the necessity of encouraging civilian aviators, to a greater extent than in the past, was realized and the following scheme of prizes was adopted:

For each civilian aviator, up to 50, who will practice aviation during the coming year, there will be given 1,000 yen under the following conditions:

He must have an international license or have displayed equal ability to those who have licenses or have an army or navy license.

Those who successfully fulfill these conditions will be given 500 yen at once. The other 500 yen will be given at the expiration of the year, provided certain conditions requiring actual flight have been complied with.

At present there are not more than seven or eight civilian aviators who are expected to qualify for these prizes.

The Imperial Aviation Society also announces a tournament on July 21, 1920, at the Susaki reclaimed ground. For speed—First prize, 1,000 yen; second prize, 800 yen; third prize, 650 yen, fourth prize, 500 yen. For altitude, the same prizes will be offered.

In addition there will be a gratuity for civilian aviators taking part. While it is not definitely fixed, it is presumed that the following aviators will take part: Hirato, Yamagata, Goto, Mizuta, Sato, and Oguri.

INFORMATION IN REGARD TO DIRIGIBLE AT-19 (FRENCH).

Source: Reliable.

(9276)

28 July, 1920.

Type of balloon, Astra Torrés, three lobed, nonrigid.
Length, 80 meters.
Width at the midship section, 16 meters.
Width at the tail fins, 18 meters.
Total height, 21.7 meters.
Approximate minimum volume, 9,600 cubic meters.
Volume of the ballonets, 4,000 cubic meters.
Two motors, Renault, of 270 horsepower.

Guaranteed speed, 80 kilometers per hour.
Useful load, 4,082 kilograms; including passengers, 560 kilograms.
Rigging and tool equipment, 240 kilograms.
Gasoline and oil, 1,250 kilograms.
Radio, 80 kilograms.
Armament, 800 kilograms.
Maneuvering ballast, 1,152 kilograms.

The envelope of the balloon is of a type identical to that of the similar balloons of the preceding series. Nevertheless the material of the upper lobe is triple rubberized fabric. The horizontal fins (empennages horizontaux) have a surface of 90 square meters and carry at the rear the elevating rudders (surface 30 square meters). There are two vertical fins, the upper one of 40 square meters and the lower one 60 square meters; the latter is prolonged by a vertical rudder of 20 square meters area.

The rudders are balanced; the control of the elevating rudders is irreversible.

Two rip panels of 8 meters length are on the upper part of the envelope.

Two gas valves are located in the lower part aft; they are automatic, balanced, and of external control.

Four air valves (one for each ballonet) exist; they are automatic, balanced, and of external control. All of these valves can be operated by hand.

The nacelle is similar to the nacelles of the previous Astra types and is of the following dimensions:

	Meters.
Length	16. 2
Width	1. 7
Height	2. 0

The two Renault 250 horsepower motors are installed on outriggers to starboard and port, outside of the nacelle. The starting is effected either from the nacelle by means of compressed air, or by a starting crank with a special magneto for starting.

The ventilator is operated by a 4 cylinder 6 horsepower Charron motor which also controls the dynamo and the alternator of the radio set.

Five gasoline reservoirs are placed in the after part of the nacelle and have a total capacity of 1,850 liters.

The total weight of the bombs and bomb-launching device is 400 kilograms.

The radio set is located in the after part of the nacelle.

The electric illumination is assured by a dynamo capable of supplying 4.6 amperes through a resistance of 40 volts. In addition there is an emergency storage battery including 16 cells of 20-ampere hours which is capable of assuring partial illumination.

REPORT OF AN ENGLISH PILOT ON THE FOKKER AEROPLANE.

Source: Reliable.

(6173)

5 July, 1920.

I flew this machine without a load and under most excellent weather conditions. Its performance surprised me. In spite of the small-powered engine (B. M. W. 180) the machine left the ground easily after a run of approximately 40 yards. She climbed easily and without any effort. Her controls are very light, especially fore and aft, these latter being quite as sensitive as on a small scout. The machine very readily answers these controls, and I found her in every way most flexible and pleasant to fly. Her performance upon such a small horsepower is really most remarkable, and this is due to the great lifting power of the one and only plane, the construction of which, though very eccentric and upon totally different lines, is proving of great efficiency.

Upon climbing to about 3,000 feet, I commenced gradually to throttle down, and to my astonishment I retained my same altitude even when running on only 400 revolutions. This is a remarkable performance and thoroughly shows the lift of this thick wing. I spiraled vertically to left and to right, both with and without engine, and the result was pleasing. The machine takes up her bank readily and easily, and shows no signs of slipping. Later I side-slipped her intentionally and she responded fairly well, taking into consideration her large span. With engine shut off, she glides extraordinarily far and at a very slow speed. She is not difficult to land, and with a little care, wheels and tail can be brought down together, and she settles down to a comfortable landing, running not more than 40 yards. In every way this machine is both efficient and pleasant.

Advantages.

Simplicity of construction, cheapness, sensitivity of controls, general flexibility, wonderful lifting property upon small horsepower, stability, slow landing, range between maximum and mimimum speed, wonderful balance empty or with passengers, easy method of filling with petrol.

DESCRIPTION OF ITALIAN SEMIRIGID AIRSHIP T-34, SAID TO BE PREPARING FOR A TRIP FROM ITALY TO ARGENTINA.

Source: Reliable.

(4853-A)

22 July, 1920.

Volume, 34,000 cubic meters. Speed, 90 kilometers per hour. Length, 125 meters. Mean diameter, 24 meters, envelope divided by a horizontal diaphragm, the upper space subdivided by vertical

bulkheads into 11 compartments; the lower into 6. To the envelope is attached a steel body, triangular in section, forming a strong bow, giving protection to the elevating rudders aft, and having the three groups of motors in the waist. The elevating rudders are of the triple system, balanced, joined to a fixed triplane, which latter serves to increase the efficiency of the rudders. The direction rudders consist of eight wings, also joined to a fixed area.

Three fins, two lateral and one dorsal. The three groups of two independent motors each drive wood propellers direct. Total power 2,500 horsepower. Motors are of type L. E. 28, Ansakdo.

VICKERS COMPANY.

Source: Reliable.

(13332)

28 June, 1920.

In the course of inspection of the *R–80* at Barrow, the following information relative to Vickers aviation activities was obtained:

The order placed by the Chinese Government for 50 Vickers Vimy machines is nearly completed. It is understood that there is British capital behind this order.

The Vickers firm is now building for the Dutch Government several flying boats of the Valencia type. These boats are of conventional wooden hull and wing design and are to be fitted with two Rolls-Royce 600 horsepower Condor engines. It is understood that the Dutch Government intend to use these boats in their colonial possessions.

It is possible that the Vickers firm will contribute 50,000 pounds toward capitalizing commercial airship enterprise. It is believed that each one of four British steamship companies will contribute a similar amount, bringing the total to 250,000 pounds.

To encourage investment and demonstrate the practicability of using rigid airships for mail-carrying service, the air ministry plans to send *R–33* to the East to run mail trips between Karachi, Cairo, and Colombo. Funds will probably be allocated from department of civil aviation. It is not planned to carry passengers on these trips. The date of departure of the *R–33* at the present writing is unknown. The firm of Armstrong & Whitworth will not furnish capital for airship commercial enterprise.

The aviation designing staff of Vickers has been reduced from a war-time complement of 45 to 12. This staff is now principally engaged in designing mooring masts with lifts, etc., for airships.

NEW AERODROME ON PESCADORES.

Source: Reliable.

(7210)

27 July, 1920.

A Japanese naval officer who is employed with the Formosan government states that a big aerodrome is to be established at Mako, the naval station in the Pescadores, for aerial transport to and from Formosa, China, and the adjacent islands. The present aerial force in Formosa, says this officer, "is of no real benefit for the purpose of suppressing the aborigines," but he thinks that if more machines were employed "the results would be more assuring." He certainly makes no pretense that the aeroplanes are simply to enable the police to cover the ground easily or to keep an eye on the aborigines with the minimum risk of losing their heads. What with the deadly electric barrier and the aeroplanes the aborigines' lot must be a somewhat unhappy one.

AMPHIBIAN AEROPLANE.

Source: Reliable.

(13054)

15 June, 1920.

It is understood that after a satisfactory test flight on land at Brooklands, the Vickers Viking amphibian machine, fitted with Rolls-Royce Eagle 8 engine, has been successfully tested on the water at Cowes.

The length of run before getting off on the water is reported to be 150 yards, with full load, fuel and water, pilot and four passengers. Top speed is 112 per hour.

VICKERS VIGILANT FLYING BOAT.

Source: Reliable.

(13287)

21 June, 1920.

The work on the Vickers Vigilant flying boat has been recently stopped by the British air ministry owing to shortage of funds. It is understood that all design work in connection with this craft had been done, and some of the metal wing sections already constructed.

The characteristics of this machine are understood to have been as follows:

Power plant, eight 600 horsepower Rolls-Royce Condor engines.
Overhaul length of hull, 120 feet.
Beam, 20 feet.
Displacement (normal load), 101,000 pounds.
Passenger-carrying capacity, for short flights, 100 persons.

MISCELLANEOUS.

LEADER GEAR AS USED BY THE BRITISH NAVY FOR PILOTING VESSELS THROUGH MINE FIELDS AND IN AND OUT OF HARBOR, ETC.

Source: Reliable.

(13343)

2 July, 1920.

Character and Purpose of Device.

The leader gear consists of an insulated wire laid on the bottom in the safe channel and of a receiving set on board ship. A high frequency alternating current, broken up into dots and dashes, pulsates in the leader wire and, by listening to this in the receiving set, it is possible to con the ship so that it will follow the lead of the wire. It is only necessary to steer in such a way that the signals will be received with maximum intensity from one side to know that the safe channel is being followed and that the ship is but a short distance from the leader wire. Ships on opposite courses may follow along opposite sides of the wire, thus avoiding interference with one another.

The Submerged Cable.

In the installation herein described the cable was 17 miles long. The copper core was composed of seven wires. Outside of the rubber there was an armoring of 12 steel wires of No. 2 gauge. The wire is often referred to as 108–110. It is understood that this means that the weight of copper in the cable is 108 pounds per mile of length, and that the rubber weighs 110 pounds per mile of length. At Harwich it was stated that a twin wire conductor was used, but this was only because that sort of wire happened to be more readily available at Harwich. The total resistance of this wire is about 30 ohms for the 17 miles. It was asked whether the requirements prohibited the use of old wire on tripod hydrophones. The officer thought that it probably would do, but, in looking over their junk pile for suitable wire, they thought it best to take a more heavily armored type of wire, as the leader gear installation would be so very permanent. Once put down, it would probably remain there indefinitely.

The only other suggestion made concerning the wire was that it might perhaps be improved by placing loading coils around it. Apparently there was a need for this, as signals of greater intensity were received from the wire than at the far end. It was considered

that loading coils would be a useful improvement, but because of the material at hand and the limited staff it had been impossible to install them. The wire was laid on the bottom in about 8 fathoms of water inside of the harbor, and this depth increased to about 24 fathoms.

Sending Apparatus.

Here, as with the cable, they had used what material was at hand. The motor generator was of 2 to 3 kilowatt capacity. It was thought that a 5-kilowatt machine would be better. It was some old gear obtained from a broken Fessenden oscillator. The frequency was 500. Perhaps it delivered about 250 virtual volts. At any rate it was successful in producing about 10 amperes flow into the leader wire, and it was estimated that about 1½ amperes were delivered by the wire into the surrounding water.

The signals sent were a series of three dots followed by a dash. In other words, it was the letter "V" sent continuously, as is often done in radio work. It was sent by a motor-operated sending key. It was not practicable to see either the submerged cable or the sending gear, as they were in a small fort on the other side of the harbor. In passing this fort the operators were directed by signal to start their leader gear signals; unfortunately it could not be visited in the time available.

Receiving Gear on the Ship.

The receiving gear is not under water as might at first be supposed. It consists of a coil on either side of the ship just below the level of the deck.

To reduce the lengths of leads it was placed slightly forward of the bridge so that it might be seen from the bridge and could be handled conveniently from the forecastle. Each of the coils was a square section, the side of the coil being 3 feet in length. The wire in the coil was of 26 SWG. It was thought that 18 SWG would be better.

These square frames of the coils were sheathed with wood as a protection against water. They were hinged to the side at the upper edge and were inclined outward toward the bottom at an angle of about 15° from the vertical. Questions were asked as to the reason for locating and aligning the coils in this particular way. It was stated that when the wire is on the bottom, it may be considered that lines of force are concentric to the wire. These lines of force cut the coils at a more favorable angle for receiving the signals if pointed in this way. The signal is louder on the nearer coil because of the inclination outboard of its lower edge, and the difference between the intensity of the signal on the nearer coil and on the farther coil is increased also by the same effect, as the far coil being more distant is somewhat shielded by the metal of the ship and is, furthermore, inclined at a less favorable angle for receiving the signals. With the bottoms of the coils spread outboard in this

manner the difference between the intensity of the signals in the two coils is increased and the signal in the nearer coil is greater, because the leader wire, when the ship is in position, lies quite closely in the plane of the coil.

It was asked if better signals could be obtained if the coils were under water. It was stated that the lines of force seem to go through air and water about equally well, and there was no special point in submerging the coils except, perhaps, for using them on submarines. About the only thing which did much screening was the metal of the ship's hull, which decreased the intensity of the signal received in the coil on the off side from the wire.

Gear on the Bridge.

Because of the location of the coils near the bridge the leads from them to the bridge were quite short. They ran, first of all, to a small box about 1 foot by 2 feet by 2 feet high. Inside of this box was a 4-volt battery and a 3-valve low frequency amplifier. It was the same device that the British Army had used in the field for listening to enemy telephone conversations. It was marked "C. Mk. III." There were three peepholes in the top of the box through which it could be seen at a glance whether the valve filaments were incandescent. It is believed that our electrical experts know sufficient about listening devices used to overhear enemy conversations at the front so that the details of this standard British set can be understood from this brief description.

Arrangements of Head Sets, Transfer Switches, Etc., on the Bridge.

The amplifier box was placed on deck just behind the bridge screen. Overhead there was a small transfer switch that could throw in either the starboard or the port coil, but not both at the same time. Two head sets were connected up. These appeared to be ordinary radio head sets and had "60 V" stamped on each coil. It was stated that the head sets should not be brought closer than 3 feet to the standard compass. There was also a loud speaking trumpet connected with the radio telephone, and it was said that it was hoped to utilize it so that the navigator would not have to be tied up to a head set, but could move anywhere on the bridge and could go as close to the standard compass as he desired. There was some discussion among the officers about this. Some thought it was a fine idea, because all hands could hear the signals. Other pessimists were sure that, if the signals could be heard on the bridge, all the signalmen, quartermasters, and hangers-on would be so busy listening to the signal that they would not attend to their own work. But the idea of having the signals audible on the bridge was more generally favored.

A small condenser was placed across the receiving sets. Experience demonstrated that it improved matters to have it in place.

Method of Operating.

The idea is that the signals shall only be sent in war time and then only when necessary. An incoming ship maneuvers until it picks up the signals from the wire. At the far end of this wire in about 24 fathoms of water it may be heard at a distance of about 300 yards. On the inshore end it may be heard at a distance of 500 yards. The signal sound is very faint at first but increases quite rapidly to a maximum. When quite distant it is often difficult to determine which side of the ship it is on, as the port and starboard coils receive signals of very nearly the same intensity. But from the direction of approach one can, in general, have sufficient information. If there is any doubt, one may head around on different courses and experiment. Since the end of the wire is many miles at sea, there is always sufficient sea room and time to do this. When once on a course parallel to the wire, it is easy to judge whether the signals are becoming stronger or fainter. Changes of course of 2° to 4° were made in order to follow properly. We were allowed, as part of the demonstration, to try this ourselves, and there was no difficulty at all in conning the ship and giving the necessary changes in course, even though several fairly sharp turns had to be made. At the seaward end of this particular wire the signal is first made out about 300 yards away. It is a good thing to run across the wire once to determine what the maximum intensity sounds like. Then one eases back so that it comes in with somewhat reduced intensity. After having been told a few times by an experienced operator about how far off he thought the wire was, it was attempted to estimate this. "Does that sound like 200 yards?" the officer was asked. Our guesses were said to be fairly accurate, even after this very limited amount of experience. The only additional hint necessary was that the sound did not reach half intensity at half distance, as the maximum was perhaps sharper than this. This is difficult to express scientifically in a quantitative way, and it is very difficult to say what "half intensity" means. All this is not a very vital matter, and we can leave it by saying that there is very little trick to judging how far off the leader gear is if one has had even the slightest experience with it.

Electrode Receiving Gear.

It is possible, instead of the coils described, to use a trailing wire to receive the signals. By this means one is able to hear the signals about twice as far as with the coils. The usual scheme is to use a twin conductor of almost any sort of wire, trailing about 120 yards astern. One wire of the twin conductor is exposed at about 20 yards astern, and both the ends exposed at 120 yards, thus being grounded in the water. The return could be made through the ship, but, by having the complete water circuit away from the ship, fewer ship

noises are picked up. However, in any case the electrode receiving gear gets more water noises than the coils do. The wire trailing in the wake is confusing during a turn and never indicates which side of a ship the signals are on. It is a fairly workable scheme but is not so well thought of as the coils.

History of the Development of the Device and the Intended Use to Which it Will be Put.

The idea of the device seems to have come from Germany. It was stated that the survivors of one of the captured German submarines (*U-48?*) mentioned that, in going out of certain German ports, the officers had some coils on deck, and they thought these were used to find the way out.

The intelligence section, after consultation with experts, decided that it must be a type of leader gear. All other prisoners were questioned along these lines and, finally, the conclusion was reached that the German apparatus used coils, and that there was not one wire in the German scheme, but two wires. There was a sort of lane within which the submarine maneuvered. In the German system the different wires sent different kinds of signals. For instance, during five seconds the wire on the right might send continuously throughout the whole third second in the interval. The wire on the left might send a double signal continuous during the whole of the second and of the fourth seconds. If one were exactly between he would hear a series of continuous signals of undiminished intensity lasting three seconds. If he got somewhat to the right the three-second dash would be no longer of uniform intensity. It would be weaker at the beginning and at the end and stronger at the middle, as the signal from the right wire would stand out more prominently. If he approached the left wire, the three-second dash which he would hear would seem to be loud at the beginning and at the end and not so loud in the middle.

It was inquired whether this was preferred to the single-wire system or not. The officers did not prefer it for several reasons. In the first place, this system required twice as much wire, so that, to justify the use of it, it should give twice the efficiency, which they considered it did not. On the whole, keeping on opposite sides of the same wire seemed safer to them from the point of view of avoiding collision from ships on opposite courses.

They have never been able to find out, either before or since the armistice, the electrical characteristics or the particulars of the equipment used in the German system. They started simply with a knowledge that such a thing existed and tried to devise a satisfactory gear. The idea is not a new one. There are many patents quite a number of years old. The reason that the old gear did not work was that it was before the days of amplifiers and, with a three-

valve amplifier, one can do almost any difficult thing in radio or receiving work. The idea of the older inventors was all right, and nothing has been added to it, but these inventors came along before the general introduction of valves gave them any hope of having a satisfactory receiving device.

As is well known, during the war amplifiers were applied to schemes for listening to enemy telephone conversations. At Polygon Wood the British had a special establishment of this kind. They had the most sensitive valves imaginable, and were able to pick up any conversation within a great radius. The only drawback to this establishment was that the extreme sensitiveness resulted in hearing so many things at once that, because of the confusion, it was not always possible to separate them. In looking around them for ready-made devices which would fulfill the needs of the leader gear, the Army sets were obviously the ideal thing. The leader gear signals would be the only thing heard, and such sensitiveness as could be obtained would be useful. Therefore in starting the experimental work they had very little more to do than simply to call upon the Army for the field sets which had been developed to listen to enemy telephone conversations.

The cable in Portsmouth Harbor is understood to have been down about one year. It has not yet been used by the Mercantile Marine.

Future Policy.

One of the officers was asked what his conception of the ideal leader gear would be. He said that he had just finished a study of this matter. He thought that it was possible to economize on cable. He thought that it should run out about 40 miles from port. He thought that its signals should be audible at a distance of about 1,000 yards. He was asked why such a great range was necessary.

He thought that the merchant marine would not have very expert operators and might run over the wire without finding it if the listening interval was too short. It would seem, however, that with a radius of one mile that even a high-speed vessel would have sufficient time to hear the signal, even if running on a course 90° to the wire. On more converging courses the interval would be increased. He admitted that the 1,000 yards requirement was too large rather than too small. Still he thought it liberal though not excessive. He thought that the gear should be a bridge fitting, cared for by the wireless people. He would have it built in a cabinet in the chart house, with leads running up to the bridge and with the ship's wireless people responsible for its upkeep. He would try to develop the loud-speaking radiophone receiver so that it would give signals all over the bridge, preferably from a trumpet over head. The throw over should be placed overhead and the switch itself should be so

constructed that a movement of it to port or starboard would indicate that the port or starboard coil was in use. He was asked whether he considered the invention was one of the type which should be kept confidential and reserved for war use only, or whether he thought that, like the radiocompass, it would be better to release it for general purposes of navigation.

He thought that it should be released for general purposes, and said that they had just put forward a proposal to various harbor authorities to see if they could not get them sufficiently interested to install leader gear in different harbors, preferably having the harbor authorities pay for it themselves. The great point that they were making was that often ships would be fog bound outside of a port and, after a delay of some time during which there was little work on the docks, the fog would clear and many ships would arrive at once, causing great congestion and delay, as compared with what conditions would be if arrivals were continued regularly. He thought it possible to convince harbor authorities that it was to their own financial advantage to undertake as an enterprise the fitting of the leader gear. He thought that the present development had brought the apparatus to a state of perfection where it would be quite practicable to issue it in its present form for use in the merchant marine. He could convince shipowners, he thought, that if by means of it they got into harbor, saving one day's delay, they could on a single occasion pay for the cost of the coils and amplifiers required.

Application to Cable Repair Work.

At the present time they have had good success in locating breaks in submarine cables. He said that, recently, the cable experts by the usual methods had estimated that a break was 3½ miles off the Irish coast but that, using the broken end as a leader gear, they had gone out and found it only 1½ miles from the shore. In another case they got the distance of the break all right by the usual methods, but the cable was a mile or two from where it was supposed to have been laid. For ordinary leader gear work he thought the device should be suitable for operation in at least 40 fathoms of water. In the cable work off the Irish coast they were working in 50 fathoms.

Other Things Noted at Portsmouth.

During this visit the seaplane carrier *Eagle* was seen about 5 miles farther out to sea. A plane was sent up from her and, later, firing was heard. From a distance the target practice of a large number of ships firing was visible. The splashes of salvoes could be seen and apparently the plane was doing the spotting.

The signal school is closed, and that is the reason why the date for the demonstration was arranged at this time.

The officer in charge of the demonstration had read an article in the Scientific American of 12 June which interested him, as it dealt

with aids to navigation obtained, apparently, by means of a modified K tube. He wondered whether we were going ahead with supersonic antisubmarine detection. He thought it the most promising line, but that two complementary devices, such as the K tube and supersonic detection, were necessary and that no one system would do all that was required.

BRITISH WAR COURSES AND QUALIFYING COURSES FOR STAFF OFFICERS OF THE ROYAL NAVY.

Source: Reliable.

(13444)

3 August, 1920.

The following has been obtained from the Admiralty, descriptive of the senior officers' war course and the course for qualifying staff officers:

"Before the war, the senior officers' war courses, and the qualifying courses for staff officers both took place at the war college in Portsmouth Dockyard, but arrangements were in hand for transferring them to the Royal Naval College at Greenwich. Nothing was done during the war, as both courses were naturally in abeyance, but on its coming to an end, they were revived in a somewhat different form, the two courses being conducted independently of one another.

"The senior officers' war course was reinstituted at Greenwich in March, 1920, under the direction of Rear Admiral H. W. Richmond. About 20 officers attend each course, which lasts four months, and it is intended to hold two courses each year. The course is designed chiefly for comparatively junior captains, prior to their taking up commands afloat, but senior commanders, senior captains, and flag officers are occasionally included. Two officers from the army also attend each course.

"A syllabus of the course is attached.

"The qualifying course for staff officers is now held separately from the senior officers' war course at the Naval Staff College, which was instituted at Greenwich in June, 1919, under the direction of Capt. the Hon. R. A. Plunkett-Ernle-Erle-Drax. The first class, which consisted of 15 naval and 1 marine officers, began on that date and completed on 4th June, 1920. Future courses will begin on 1st of October each year and finish 30th of June, and the numbers are to be increased.

"It is hoped that 36 to 40 may take the course each year. Candidates for the course must be between the ages of 24 and 34 at its commencement, though these limits may be exceeded in exceptional cases. Two army and two air force officers are attached to each course.

"The syllabus is on the same lines as that of the senior officers' war course, with the addition of English (written and spoken) and the special duties of a staff officer.

"The attached addresses, delivered at the opening of the Naval Staff College by Admiral of the Fleet Sir H. Jackson, president of the Royal Naval College, Greenwich, and Capt. Drax, describe fairly fully the scope and objects of the course."

The syllabus for the senior officers' war course is quoted in full as follows:

Senior Officers' War Course Syllabus. Strategy.

"National policy and its relation to national strategy.

"National strength in war.

"Governing considerations of whether national policy shall be primarily naval or military. Examples of British and French policies in the past and their effects.

"Major naval strategy. The aim of naval warfare.

"Examples from wars from sixteenth to twentieth centuries.

"Concentration of effort.

"Concentration of force. Limits imposed upon pure concentrations by other demands upon naval force.

"Deflecting influence of the demands upon naval force.

"Importance of decisive action in strategy.

"The enemy's fighting forces the primary objective of the navy.

"Spanish and French theories from sixteenth to eighteenth centuries.

"Dutch fighting principles in the wars of seventeenth century; reasons for Dutch failure. Russian principles in 1854–55, and Russo-Japanese War.

"Effects of attempts to conduct war by measures tried to overcome effects of the defensive.

"Usefulness of the pure defensive. Commerce destroying in grand strategy in Spanish, Dutch, and French wars; in wars of nineteenth century. Decisive action and its influence on the attack and defense of commerce.

Bases.

"Their relation to naval operations. Attack upon enemy bases. Growth of bases. Defense of bases. Relieving invested places. Illustrations from recent war on so many of the above for which authoritative information is available.

Organization.

"Organization in its relation to preparation for and conduct of war. Staffs at Admiralty, in fleets, and at bases. Functions and use of a staff.

Intelligence.

"The intelligence system, how organized, distributed, and how to use.

Economics.

"The relations of finance and trade to strategy. Their influence upon war. Illustrations from experience of past war.

War Plans.

"The preparation of plans for war.

"Limits to which operations or movements can be prepared beforehand.

The Offensive in War.

"Attack upon trade. Its place in war. Influence of trade attack on war. 'Private property' and trade attack.

"Attacks upon over-sea possessions. Their place and objects in war.

"Attacks upon defended places. General principles of such attacks. Opinions of commanders in the past as to proper measures. Examples in wars of sixteenth to twentieth centuries. Changes in modern conditions. Attacks and their methods in recent war.

Combined Operations.

"Organization of Army: knowledge of, needed by naval officer. Transport service.

"Defense of transports on passage.

"Preparation for combined operations. The command.

"Responsibility of each service.

"Technical preparation and work of disembarkation.

The Defensive in War.

"Trade defense. Its principles. Past methods of trade defense and their modern application against surface ships and submarines.

"Convoy work in its practical aspect and organization.

"Tactical principles governing defense of a convoy.

"Territorial defense. (*a*) Principles of defense of United Kingdom. (*b*) Defense of over-sea dominions.

International Law.

"A course of lectures having as their object the practical influence of international law, as exemplified by the recent war. The growth of international law and its effect upon naval war and the conduct of naval commanders in the past. How naval officers (*a*) when preparing for war, (*b*) when conducting war, are affected by international law to-day.

Tactics.

"The governing principles of all tactics; the primary principles of war applicable to strategy and tactics.

"Tactical considerations and the organization of a fleet.

"The practice of commanders in the past. Results of each as shown in battle.

"Coordination of all arms in battle.

"Weapon technique and tactics.

Minor Operations.

"Diversions, eccentric attacks, and feints.

"Coastal bombardments in support of troops.

"Operations against submarines in their recent stages of development.

"Mining operations.

"Particular operations of the past war.

"In addition, lectures will be given on various subjects which do not come directly under the above readings.

"No instruction of a purely technical character will be undertaken at the War College.

Individual Work.

"The work will include application of the principles by individual study of problems of a strategical nature, the geographical, military, and economic conditions of possible enemies in as great detail as practicable; and also an examination of such of the operations of the recent war as authoritative information available permits, for which the monographs prepared by the Admiralty will be employed."

FOREIGN TRADE DEVELOPMENT CRUISE.

Source: Reliable.

Outline of Plan.

A brief outline of the plan is to arrange and equip the steamer *Von Steuben* so that a large number of manufacturers and exporters interested in foreign trade may send one or more of their personal representatives with samples and exhibits to about 40 countries of the world for the purpose of solidifying old and making new sales connections—selling and buying—and transacting such other business in which they may be interested.

Selecting Participants.

The principal associations in the United States formed by American manufacturers and exporters have been informed fully regarding the nature and objects of the cruise and the members thereof notified.

A selected list of representative firms have been approached direct, so that as many as desire may express their wish to participate and so form a nucleus, the prestige of which will constitute a high recommendation and approval of the cruise.

The financial standing and business integrity of each participant must be beyond question.

The number of firms participating will depend upon the accommodations of the steamship for passengers, samples, and exhibits. The maximum number is estimated to be approximately 700.

All participants must be "100 per cent American," as the cruise will be made wholly in the interest of American foreign trade.

No studied attempt will be made to restrict participation to only one of each article or line of manufacture, but it is of first importance that those participating cover a wide range of goods truly representative of the diversity of American industry.

All applications for participation will be passed upon by an advisory board composed of seven or nine prominent business men.

Method of Procedure.

Through paid publicity and advance agents the coming of the ship will be made known widely in each country. Those interested in each country, Government officials, importers, business men, industrial executives, etc., will be informed fully as to the purpose of the visit to their shores. They will understand that a great foreign American trade ship will give them an opportunity to inspect the samples and exhibitions of a wide range of American manufacturers and to discuss terms of sale, representation, agencies, etc., with their personal representatives.

Upon arrival in each port a dinner will be tendered to the various Government officials, their staffs, the leading merchants, business men, importers, etc. This reception and dinner will, of course, also be attended by the representatives on the cruise and its purposes and advantages are obvious.

The time to be spent in each port has been approximated herein, but the actual time spent in such port will be determined by the trade and other conditions at the time. In practically all instances the ports to be visited on the cruise are at the same time the principal business cities of the countries in which located.

Facilities of the Steamship.

The management, equipment, and facilities on the steamship will be the same as on any modern ocean liner. All will be first-class passengers. The cuisine will be unexcelled and all the personal conveniences found in the modern hotel will be furnished. No details will be overlooked that would provide for the comfort and safety of the passengers. For facilitating the transaction of business, there will accompany the steamship a staff of competent translators, typists, stenographers, and clerks.

Arrangements will be made with a large banking institution to establish a branch bank on board ship to attend to financial matters throughout the trip. This will facilitate the handling of financial matters in connection with sales in each country. The bank may also be utilized by the representatives for the deposit of their personal funds, letters of credit, etc.

Advantages of the Cruise.

The advantages of the cruise are so obvious and numerous as to readily appeal to the American exporter, whether already established abroad, just starting to export, or intending to seek foreign trade. To the exporter who already has extensive foreign connections, this cruise will enable him to send a personal representative to inspect the various fields and keep in close personal touch with his agents and branches. To the exporter who has limited connections the cruise will enable him to secure others and make extensive sales.

The Principal Advantages Are:

1. *The saving of time.*—The time consumed on this cruise will be far less than it would take an individual representative to visit the same countries.

2. *Economy.*—The cost of sending one or more personal representatives with complete samples or a working exhibit to the same countries would be exceedingly less on this cruise than if taken on their own.

3. *Prestige.*—The support, approval, and cooperation which this undertaking will receive from all sources, official and otherwise, will give an entrée and prestige to those participating that could not be achieved otherwise.

4. It will enable those manufacturers of heavy, bulky goods to place a display before foreign buyers in their own ports, when to do so under ordinary conditions would be an unprofitable expenditure of time and money.

Route of the Cruise.

Upon completion of the vessel, not later than February, it will leave the port of New York, visiting the following ports in the order named, and spending the minimum number of days in each one as stated.

Port:	Days.	Port:	Days.
Pernambuco	1	Yokohama	14
Bahia	2	Shanghai	14
Rio de Janeiro	6	Hongkong	14
Montevideo	3	Manila	3
Buenos Aires	14	Singapore	14
Cape Town	6	Batavia	14
Port Elizabeth	3	Pandang	3
Durban	2	Penang	3
Delagoa Bay	3	Rangoon	14
Tamative	3	Calcutta	14
Port Louis	1	Madras	6
Perth	5	Colombo	14
Adelaide	3	Bombay	14
Melbourne	14	Aden	1
Sydney	14	Port Said	2
Wellington	10		

From Port Said the ports to be visited in the Mediterranean will depend entirely upon conditions existing in the various countries. The stops now contemplated are Saloniki, Genoa, Marseille, Barcelona, Lisbon, Brest, and Southampton.

Reason for Taking Route Outlined.

The route to be taken was selected after very careful thought was given to the question, and the personal experience gained by F. Eggena who has traveled extensively throughout these countries for many years. There are many good reasons for taking this route, the principal ones being:

1. In the countries to be visited the demand for all kinds of American-made goods is extensive.

2. It is imperative that American exporters get their lines intrenched in the countries to be visited as competition is growing very keen.

3. The exchange situation in each country, or in the large majority of them is favorable and the steamship will reach the Balkan and other European countries about a year hence when their exchanges are more favorable to trade than now or will be in the immediate future.

GERMAN AND AUSTRIAN SUBMARINE STATISTICS.

Source: Reliable.

20 August, 1920.

German submarines.

(1) Submarines available at beginning of war				28
(2) Submarines available summer of 1917				(?) 212
(3) Total submarines built and laid down by Germany up to Armistice—169 U, 151 UB, 121 UC				441
(4) Submarines sold and turned over to friendly nations during war and included in (3)—UB–8 to Bulgaria, UB–43 to Austria, UB–47 to Austria				3
(5) Submarines actually built and laid down for Germany—(3)−(4)=(5)				438
(6) Submarines lost before armistice, including those interned in neutral ports—67 U, 73 UB, 60 UC				200
(7) Submarines lost after armistice by sinking—U–97				1
(8) Submarines building and fitting out at armistice—29 U, 15 UB, 26 UC				70
(9) Submarines available at armistice—(5)−(8)+(6)=(9)—73 U, 60 UB, 35 UC				160
(10) Submarines built during the war—(3)−(1)+(8)=(10)—112 U, 136 UB, (including 3 turned over to friendly nations), 95 UC				343
(11) Submarines inspected in Germany—				
At Kiel	11 U	7 UB	5 UC	
At Brunsbuttel	1 U	.....	1 UC	
At Hamburg	.....	1 UB	.....	
	12 U	8 UB	6 UC	26
(12) U–157, interned in Norway, Nov. 11, 1918. UB–14, surrendered at Sebastopol, Nov. 26, 1918. UB–42, surrendered at Sebastopol, Nov. 26, 1918. UC–23, surrendered at Sebastopol, Nov. 26, 1918. UC–37, surrendered at Sebastopol, Nov. 26, 1918. UC–74, interned in Barcelona, Nov. 21, 1918.				
(13) Surrendered at Harwich—59 U, 51 UB, 25 UC				135

Summary of all German submarines at end of war.

Losses before armistice (6)	208
Sunk after armistice (7)	1
Interned in neutral countries after armistice (12)	2
Surrendered in Harwich (13)	135
Surrendered in Sebastopol (12)	4
Inspected in Germany (11)	26
Building and fitting out (8)	70
Total	438
Turned over to Bulgaria and Austria (4)	3
	441

(NOTE.—U–42 was not built.)

Austrian submarines.

(1) Available at beginning of war	11
(2) Available summer of 1917	16
(3) Lost prior to summer 1917	6
(4) Built by summer 1917—sum of items (2) and (3)	22
(5) Built and laid down up to armistice—includes item (1)	39
(6) Lost before armistice—includes item (3)	8
(7) Building at armistice	13
(8) Available at armistice—item (5), less items (6) and (7)	18
(9) Built during war—item (5), less items (1) and (7)	15

(NOTE.—The Austrians built submarines numbered as high as XLVII, but it appears that certain numbers were omitted from the series. It is impossible to accurately determine what numbers were left out. The above figures have been compiled from the most accurate data at hand in the Office of Naval Intelligence, but for the reasons outlined here, are necessarily not accurate.)

STATEMENT OF A BONIN ISLANDER SERVING IN THE JAPANESE NAVY.

Source: Reliable.

(6746)

27 July, 1920.

An old seal fisherman (American) was wrecked on the Bonin Islands about 26 years ago.

He married a native woman (half native and half Portuguese) and took out Japanese citizenship papers in order to hold property in the islands.

The son is now 24 years old and has been about 13 months drafted in the Japanese Navy.

Is now serving in the battle cruiser *Kongo* as a seaman, second class (his conscription is for three years).

He said that the *Kongo* is provided with a sausage balloon and that a 3-foot range finder is used in the car of this balloon. This balloon is used at target practice and during drills.

Ranges were received by telephone from the balloon.

No openings for ingress or egress in the turret roofs. The officers and crew enter and leave by the trapdoor in the floor of the overhang.

When an officer considered a man slow or late in coming to his station he struck or kicked him or slapped him in the face. The man said he wished the men could enter from above to avoid being struck in the face.

On one occasion when he relieved the wheel late and was munching some Japanese cakes, the officer of the deck struck him in the face and made him spit out the cake, condemning him for being late and telling him that in war time (this was during the fall maneuvers, 1919) duty and prompt relieving came before eating.

Every Japanese sailor has a daily allowance of two glasses of yellow Japanese wine, heavier than sake, and a man may easily get more than his ration. He said there were always two or three drunken sailors lying around the ship.

There is no penalty for drunkenness unless there was disorderly behavior, which entailed being locked up until sober.

On board ship the men do not fight, but once ashore the sailors from the various ships and from the barracks fight daily. Before going on liberty their knives are taken off the lanyards and collected and every man is searched by the officer of the deck to discover if he carries any concealed weapons.

This is necessary, because an average of one man a day is badly wounded or killed at Yokosuka. This fighting is caused by heavy drinking on shore.

In addressing the enlisted men, the officers use an overbearing manner and abusive language, treating them like slaves.

Men are not reported by the officers for petty offenses, but are summarily punished on the spot, being struck or knocked down.

The ration consists of rice, fish, cakes, and tea. The man did not complain about the quality, but apparently the ration is a little skimpy. The men spend their money on liberty for food and drink.

In speaking of this year's recruits he referred to them as the "riffraff of Japan," except for quite a number of men from the Bonin Islands.

These Bonin Islanders are fishermen and while they know nothing of ships and are difficult to discipline, they know the sea and do especially well in the ship's boats—are good material.

He stated that all the young men in the Bonins of or near the conscript age had been drafted this year. This is the first occasion on which naval recruiting has been extended to the Bonins.

His pay as seaman second class is a little more than 14 yen ($7) per month. His uniform is furnished by the Navy.

A careful record is kept of the issue of clothing, monthly bag inspection held and clothing replaced if the officer considers it worn out after proper care and passage of time. If not well cared for the man is given a small fine.

This man went on liberty about once a week.

Overnight liberty is granted men if their homes are in the vicinity of ship; otherwise it expires at midnight.

If a man is more than 10 minutes late from liberty he gets three months restriction to the ship. No excuse is accepted.

The men are evidently not too hard worked, but are practically all dissatisfied with the way the officers treat them.

The men are not energetic, industrious, or ambitious, because the promotion is so slow. They must serve one year each as seaman third, seaman second, and seaman first.

Every man is examined at the end of a year in his grade and promoted if he passes and is recommended.

He complained that an enlisted man with a perfect record and passed every examination it would take him 16 years to become a chief petty officer. The average man takes 19 years to achieve this rating.

NOTE.—Chief petty officer in the Japanese Navy apparently corresponds to warrant officer in the United States Navy.

There is a great deal of small arms target practice at Yokosuka where the *Kongo* lay during his 13 months' service.

The men were landed very often, and fired 15 shots each time (3 clips). They fired standing, squatting on their heels, and kneeling.

The natives of the Bonins were originally Chomorrow. Whalers married these women.

This man has no Japanese blood and hates the Japanese.

NAVAL AND MILITARY ITEMS.

Source: Reliable.

(12925)

27 July, 1920.

An explosion of a shell occurred on board the destroyer *Tsubaki* during the navy maneuvers off Saeki Bay in the Inland Sea on Wednesday morning (July 21). A gunner was killed and three bluejackets wounded, one being in a dying condition.

Dr. Miwa and Dr. Takagi, two Japanese chemists, left 7 July for Germany on the *Awa-Maru* to investigate poison gas.

Lieut. Gen. T. Nara has been appointed chief aid-de-camp to the Crown Prince. He studied military science in Germany in 1902.

This year's special grand army maneuvers will be held in Oital prefecture, Kyushu, early next November. The Emperor will supervise the maneuvers.

About 300 carpenters, employed by the Army, left for Saghalien July 22. They will construct barracks and other buildings for the winter campaign of the troops to be dispatched there.

The repair shop of the Asano Shipbuilding Yard at Tsurumi was damaged to the extent of yen 200,000.

The keel of the new battleship *Kaga* (39,500 tons), was laid at the Kawasaki dockyards. The special commission ship *Chitoko* (8,000 tons), built at the Kawasaki dockyards, was launched last Saturday (July 17).

The Italian aviators who participated in the Rome to Tokyo flight will return to Italy on the *Pilsna*.

In order to initiate an aerial transport service to South China and the South Sea Islands, Japan will probably establish an aeronautic laboratory at Mako, in Formosa. Capt. Satch, attached to the Formosan government general, said it would serve as a splendid naval base for aerial activity in the future, and believes that a great number of machines will aid the Government in its work with the aborigines.

JAPANESE ABROAD.

Source: Reliable.

(7440-A)

27 July, 1920.

(From return of Japanese Foreign Office, June, 1919.)

Name of country.	Male.	Female.	Total.
British Canada	11,251	5,399	16,650
United States	88,634	36,561	125,195
Mexico	1,826	362	2,198
Panama	109	17	126
Hawaii	64,306	49,977	114,283
Brazil	18,786	12,563	31,349
South America (except Brazil)	7,346	1,384	8,730
Philippines	8,807	991	9,798
South Asia (including South Sea islands)	10,837	6,955	17,792
Oceania	6,098	182	6,280
China (including Tsingtao)	33,111	25,998	59,109
Manchuria (including Kwantung Leased Province)	103,331	77,875	181,206
Siberia	4,290	4,005	8,295
Europe	1,251	126	1,377
Africa	29	18	47
Total	360,022	222,413	582,435

Yearly increase of the number.

	Number.	Yearly increase.
1911	261, 266	5, 517
1912	292, 659	11, 397
1913	331, 262	38, 603
1914	358, 711	27, 445
1915	362, 033	3, 322
1916	414, 199	51, 166
1917	450, 774	35, 715
1918	493, 755	42, 981
1919	582, 435	88, 680

AFTER-WAR INACTIVITY OF EUROPEAN NATIONS.

Source: Reliable.

(12093)

27 July, 1920.

Rear Admiral Hideo Nonaka, who has just returned to Japan from a tour of America and Europe, made the following statement to the Japanese press regarding after-war conditions in European navies:

"After peace, all European nations are endeavoring to recover from the financial disaster that overtook them during the war, even at a sacrifice to their navies. Even militaristic nations are abandoning their bigger navy principles. I heard that the English Navy expects to open the next war with only submarines and aeroplanes.

"In general, European naval conditions are inactive. It seems that the allied nations are not taking much interest in the distribution of German warships, and are simply using them as emblems of victory to show to the people. Japan's portion is expected to be broken up in England."

INTERNATIONAL.

CONFERENCE BETWEEN FRANCISCO VILLA AND GEN. EUGENIO MARTINEZ, ACTING FOR PRESIDENT DE LA HUERTA.

Source: Reliable.

(11806)

2 August, 1920.

On or about 11 May of this year Gen. Villa held a conference with Gen. Enriquez of the de facto government near the town of Jimenez in the State of Chihuahua for the purpose of submitting terms of surrender. In this conference Gen. Villa was probably deceived by Gen. Enriquez, inasmuch as Villa entered the town with approximately 100 men and staff, as was previously arranged, and Gen. Enriquez, contrary to the agreement, surrounded Villa with about 5,000 men. Villa succeeded in getting out of this trap and headed for the mountains, where he remained at large, withholding any efforts for peace terms until entering Sabinas.

It is publicly stated that the reasons for the surrender of Villa were due to the fact that the de facto general, Amaro, has been pressing him considerably in the Palomas region, and also in view of a nation-wide request upon the new government for his apprehension and the stopping of his bandit activities, and he was wise enough to know that the end would come sooner or later. Having been offered terms of surrender by the de facto government he probably thought that it would be best to accept while he could at least make partial demands, and without loss of prestige. It is thought that he selected Sabinas for the following reasons: Gen. Martinez, the commander in chief of operations in the State of Coahuila, is an ex-Villista officer, and personally known to Francisco Villa, which would make it easier for him to negotiate; and second, probably the greatest reason, that by the occupation of the Sabinas coal basin he would be able to dictate terms to suit himself, which he did, as will be shown in paragraphs below, and in that case, if the Government refused his terms, the mines in two hours could be put in a state that would render them useless for six months or one year, and he could easily make his escape into the near-by mountains.

On the morning of 21 July, while surrounded by troops of Gen. Amaro, Villa decided to make his way to Sabinas and there treat for peace rather than be treated as a bandit if made captive and

in no position to dictate terms of surrender. He therefore broke through Amaro's lines and by forced marching entered the Santa Rosa Mountains north of Muzquiz, from whence he threw out a column to tease the garrison which skirted the town of Muzquiz, about 4 or 5 kilometers northwest, heading southward through the Aura Pass, then proceeding up the railroad track to Barroteran. Upon entry into Barroteran he is said to have had approximately 700 men, and there he made a decision as to the division of his column for entry into the Sabinas Basin, which was as follows: Three hundred men were sent north with orders to cross the Sabinas River between the Rosita and Agujita mines; approximately 150 men were sent south with orders to cross the Sabinas River at San Felipe mines and enter Sabinas from the south; the remainder accompanied Villa from Barroteran to Sabinas, entering from the west. All of these columns arrived in Sabinas at the same time. The column from the south encountered a Federal garrison numbering about 25 men who either disobeyed orders or mistook the column for another faction. Of the Federal garrison 1 captain, 1 lieutenant, and 1 sergeant were killed, and the remainding number made captives, but were later turned over to Gen. Martinez when he arrived.

Directly after Gen. Villa entered Sabinas he took complete control of everything, especially the telegraph wires and requested clearance to the City of Mexico, and notified President De La Huerta that he was at Sabinas and ready for a conference. De La Huerta immediately replied that he would issue orders to suspend military operations in that vicinity, and congratulated him upon this activity for terms of surrender, and requested him to name the official whom he desired to represent the Government. Villa replied that he wished to confer with Gen. Martinez, and shortly thereafter Villa received a telegram stating that Gen. Martinez was en route to Barroteran from Torreon, and requesting that Villa name the place of conference and make all arrangements, to which Villa replied that he desired the conference at Sabinas, and that Martinez should be accompanied by 150 men and his staff; that he would be ready for the conference on the morning of 28 July. Immediately upon sending his message to De La Huerta, Villa dispatched about 300 men north of Sabinas covering the coal mines and approaches, and also sent detachments south of Sabinas to guard that approach, and retained about 150 picked men in the town proper.

Gen. Villa occupied the house of Mr. L. M. Lamar, an American citizen, while Gen. Martinez occupied his private car at the depot. After the exchange of notes by messenger, the conference took place in the private car of Gen. Martinez at the railway station. The windows of the car are reported to have been open and the entire population of Sabinas witnessed the conference. It was entirely a

public affair. The conference opened by Villa stating that he did not wish the affair to be considered a surrender, but a peace conference between himself and the new Government. His terms were: No money; that he desired to be left entirely alone; and assurances given himself and his men of protection. Martinez then replied that Villa would have to turn over all his men, arms, and ammunition. Villa refused this, and stated that if Gen. Martinez did not have au-authority to continue the conference on other lines to wire De La Huerta and find out what action would be taken upon his refusal to turn over his men, etc.

Martinez wired De La Huerta and was informed that Villa's terms were to be accepted regardless and that the request that Villa turn over his men, arms, and ammunition be withdrawn. Villa then stated that he desired one year's salary in advance for his men, and the Government to provide him with a ranch and permission to retain all arms and ammunition now in the hands of his men, which, upon their discharge, would be turned over to him; permission to retain a picked body of 100 men as a guard if he returned to civil life; and if he accepted the command of the police in Chihuahua, then he desired to retain his entire command. Gen. Martinez, acting for the Government, agreed to all his terms. I might also add that 60,000 pesos and 80 or 90 horses were seized by Villa at Sabinas, and the Government has assumed the responsibility of paying it back.

Upon his entry into Sabinas on the morning of the 26th, about 4 p. m., he arrested Mr. Karl Haegelin, president of the Sabinas Brewery, and directed him to close up the brewery; called all saloon proprietors and ordered all saloons to be closed up, and stated that the first man caught giving or selling liquor to any of his men would be shot. He then directed his auditors, four in number, to investigate the books of all clothing and grocery stores in town and report to him those making the greatest profit during last year. He then requisitioned on these stores for shoes, hats, breeches, underwear, socks, shirts, food, forage, horseshoes, nails, and called upon the ranchmen for horses and mules. It is estimated that he took about 60,000 pesos, 40,000 pesos in merchandise, about 20,000 pesos in money, 10,000 of which was paid by Mr. Karl Haegelin, an American citizen. Mr. T. A. Coleman is the loser of 80 head of horses, valued at about $75 per head, and several head of horses were taken from the American mines.

During the conference Villa cursed many of the leaders (military) of the present Government and of the former Carranza Government, calling them grafters and traitors. He stated that he had been a bad man for many years, and this Government was the first that had tried to do the right thing in any way. He stated that he had killed his own people long enough, and if this Government desired

to make peace he would accept, but if they would not he would continue to be a source of trouble. He begged Gen. Martinez to believe him as sincere in his remarks and to consider his proposals for peace for the betterment of the country; and if the Government would not deceive him, but stand by their promises, they could expect no more trouble from the hands of Francisco Villa, but on the other hand he would use his knowledge and his men in putting a stop to outlawry and banditry in northern Mexico. He further stated that the time had come when Mexico needed men imbued with the spirit of patriotism, and not selfish interests, and if they would all get together it would not take long to build up the country to where it should be. He further stated that he believed that the Democratic Party in the United States had only a short time to stay in power and that soon the Republican Party would be in force and that they would immediately take as a pretext for intervention Villa and his past deeds, and this he wished to avoid, stating that if the United States wished intervention it would have to hunt another cause; that he was a Mexican and would stand by his country and did not wish to be the cause of intervention.

The conference lasted during the day of the 28th and up into the night. Villa, after the conference had closed, selected as his place of surrender San Pedro de los Colonias. The Government placed at his disposal 40 cars consisting of two trains, for carrying equipment and horses and such men as were not able to march overland. While Villa realized that the agreement had been closed and sanctioned by De La Huerta, nevertheless he informed Martinez that he desired to play "safety first" and march overland to the place designated as the final close of surrender when Gen. Calles would be present, when the terms could be drawn up and sent to De La Huerta for his signature, after which he would commence to disband. Until that time he would spend the time at San Pedro de los Colonias, camped peacefully near the town, living upon rations furnished by the Government.

Villa left Sabinas on the morning of 30 July, and proceeded to esquite ranch, where he spent the day rounding up the extra horses of his column, as well as seizing about 80 more belonging to the Coleman ranch. He also requisitioned 12 head of steers as beef, giving the man in charge authority to ask payment from the Government. He camped that night in the mesquite foothills near Barroteran, and on the morning of 31 July came into Barroteran, paraded his troops before the town, had breakfast on his special train, and left for Hermanas, where he spent the next night. The trains were ordered to await him there, as he is using them to eat and sleep in. From Monclova he will go to Cautro Cienegas and thence across country to San Pedro de los Colonias, the trains going

over the old Mexican International road with orders to proceed direct to San Pedro de los Colonias.

When Villa arrived in Sabinas it is reported that his men were in rags, their mounts in bad condition, and before he did anything else he requisitioned supplies for them. When he left Sabinas his men were all dressed, and many of them freshly mounted. All were equipped with three bandoleers of ammunition and a pistol. They were also reported as having several machine guns. His column was commanded by five generals, namely: Gen. Sostenses Garza, Gen. Fernandez, Gen. Quionenes, Gen. Michet, and Gen. Ruiz. His private secretary, Col. Trillo, is reported as being the best-educated man in the column. There are also locomotive engineers, linemen, doctors, accountants, and telegraph operators with him.

In conclusion it may be stated that the organization of this ignorant man is wonderful, and it is inconceivable how he has so easily made infants of the Mexican commanders. No doubt it is the untiring energy he is said to possess, along with his natural military talent, merged into the cunning Indian blood of his forefathers. At any rate the department may rest assured that the march made by Villa from Palomas is an accomplishment in which there is no precedent, especially with 700 men through a country where food is scarce and water out of the question for many miles.

The writer has spent many hours in the past week trying to reach some understanding as to the absolute truthfulness of this move; however, the more I learn and think the farther off I seem to be No doubt Villa has surrendered, but as to the sincerity and completion of this surrender is another question. In other words, it remains to be seen if Villa has out-generaled the whole Mexican Government again, or desires of his own accord to rest for a while in the bounds of civilization under the cloak of amnesty and possessing the elements necessary for defense or the warpath.

EXCERPT FROM ITALIAN NAVAL BUDGET FOR YEAR 1 JULY, 1920, TO 30 JUNE, 1921.

Source: Reliable.

(13402)

26 July, 1920.

For Running Expenses: 406 Millions; an Increase of 170 Millions Over 1919–1920.

Extra: In consequence of the war, including "naval occupation of eastern Adriatic shore," 800 millions.

Constructing four auxiliary cruisers for the State railways, to replace those lost during the war, 40 millions. This expenditure will be charged in three yearly installments; 18 millions is carried on the present budget.

Naval Aviation.

Previous to the war there was no appropriation for aviation. The sum expended was small and it was charged under naval construction. About 11 millions has been appropriated in this budget.

New Construction.

No provisions have been made for new construction, and the naval program has been suspended.

Radio.

Seven hundred thousand has been appropriated for the radio and semaphore services.

CONSTRUCTION.

AMERICAN NAVAL CONSTRUCTION.

Source: Shipbuilding and Shipping Record.

(13284)

24 June, 1920.

Sir F. Hall, on 16 June, asked the first lord of the admiralty what would be the number of capital ships possessed by the British and American navies mounting 18-inch and 16-inch guns, respectively, in 1925, on the assumption that the present naval program of the two countries was adhered to; and what would be the respective numbers of ships in the two navies with a speed of 33¼ knots or more.

Mr. Long. The answer to the first part of the question is as follows:

Capital ships mounting 18-inch guns:	
United States (according to latest official reports)	Nil.
Great Britain (according to latest official reports)	Nil.
Capital ships mounting 16-inch guns:	
United States	16
Great Britain	Nil.

The answer to the second part of the question is:

Capital ships:	
United States	6
Great Britain	Nil.
Light cruisers:	
United States	10
Great Britain	Nil.
Destroyers:	
United States (approximately)	266
Great Britain (including those now in special, reduced, and reserve complements, or 97, not including those in special, reduced, and reserve complements)	196

Sir F. Hall. Is the right honorable gentleman aware that there is a report of a ship having been built in the United States mounting 18-inch guns, and considering the number of ships being built by the United States with a speed of 33¼ knots, may I ask if he and his advisers will take particular notice of what is being done in the United States in order that the fleet of this country may be up to that of any other country?

Sir C. Kinloch-Cooke. Has the right honorable gentleman seen the recent telegraphic information from the United States that there are ships building with 18-inch guns?

Mr. Long. Yes. The Admiralty are following these very important developments with the greatest possible closeness, and he may rely upon it that we shall not fail to ask Parliament for the necessary powers if we think we shall otherwise fall behind our proper naval strength. As regards the question asked by Sir C. Kinloch-Cooke, may I respectfully suggest that he should not assume that telegraphic reports are always based upon facts?

LE BEARN, NORMANDIE CLASS.

Source: Reliable.

(3509)

30 July, 1920.

It has been learned from reliable source that the *Bearn* (*Normandie* class) laid down at La Seyne, near Toulon, 1914, is to be completed as an aircraft carrier. She will be provided with a deck for the landing of aircraft. This has not yet been authorized by the Parliament, but is considered as practically certain.

The *Bearn,* on the 1st August, 1914, was about 15 per cent completed; the other four vessels at the same date were estimated as 60 per cent completed.

The following are the dates of the launching of four of the *Normandie* class:

The *Gascogne,* at Lorient, 30 September, 1914.

The *Normandie,* at Saint-Nazaire, 19 October, 1914.

The *Flandre,* at Brest, 20 October, 1914.

The *Languedoc,* at Bordeaux, 1st May, 1915.

The cessation of work relative to the guns intended for the armament of these five battleships was directed by circular dated 22 July, 1916.

A circular, 16 January, 1918, decided to suspend until further orders, all work in construction yards, and that at the works of subcontractors pertaining to the four above-mentioned vessels.

Re the *Bearn,* the construction of which was less advanced than that of the other four, the same circular of 16 January, 1918, authorized the necessary work for launching this vessel, which would free the corresponding ways.

The *Bearn* was launched 15th of last April and is now moored at the Milhaud Dock in the harbor of Toulon. She has had no armor, engines, nor boilers installed.

It may be added that the utilization of the *Bearn* as an aircraft carrier is following the lead of the English in the case of the *Eagle,* a late battleship of 28,000 tons.

NEW TANKERS FOR JAPANESE NAVY.

Source: Reliable.

(6453)

27 July, 1920.

With the growth of the Japanese Navy, and the subsequent need of oil fuel, it is imperatively necessary to immediately increase the number of naval tankers.

The three present tankers, *Noma, Susaki, Kensaki,* are no longer sufficient.

On 17 July the new naval tanker *Chotoko* was launched at Kobe from the Kawasaki yard. She has a fuel cargo capacity of 8,000 tons. Should be completed by September.

The *Notoro,* launched recently at Kawasaki yard in Kobe, will be completed in July. The *Chisho* and the *Kinsho,* now building at the same yard, and the *Sata,* building at Yokohama Dockyard, will be ready about October.

In August the *Shiriya* will be laid down at the Yokohama Dockyard and the *Tsurumi* and the *Sekiro* at the Osaka Iron Works.

These new special service vessels will be of about 15,000 tons and have a fuel cargo capacity of 8,000 tons.

THE "NISHIMA MARU," NEW JAPANESE MINE-LAYING VESSEL.

Source: Reliable.

(5975)

23 June, 1920.

The *Nishima Maru,* an 800-ton mine-laying vessel, which is now in the course of construction at the Kure Dockyard, is to be launched 12 June.

This vessel is modern in every respect, putting into effect all the lessons learned during the European war.

It is said that she is high-speed, being able to lay mines three times as fast as the present vessels used by the Japanese Navy for that purpose.

NAVAL SHIPBUILDING ON WAYS AT MITSUBISHI YARD, NAGASAKI.

Source: Reliable.

(9324)

27 July, 1920.

Two 800-ton destroyers in water, one apparently completed and ready for commission; the other still completing, battery not installed.

Two 1,300-ton destroyers in water, one apparently recently launched and still unpainted; the other still completing at a buoy, battery not installed.

Three 1,300-ton destroyers building.

SUPERDREADNAUGHT "KAGA"; DESTROYER "NOKAZE"; BATTLE CRUISER "AMAGI."

Source: Reliable.

(10445)

27 July, 1920.

The ceremony of laying the keel of the superdreadnaught *Kaga*, 43,800 tons, which will, when completed, form the main strength of the "eight-and-eight" squadron, will take place in the Kawasaki Dockyard, Kobe, toward the end of this month.

About the same time the building of the first-class destroyer *Nokaze*, with a tonnage of over 1,000 and a speed of 34 knots, will be started at the Maizuru Arsenal.

The building of the new battle cruiser *Amagi*, which will be larger than the *Haruna* class, will be commenced at the Yokosuka Arsenal in September.

FIRST-CLASS DESTROYER "NADAKAZE."

Source: Reliable.

(13024)

9 July, 1920.

The first-class destroyer *Nadakaze* was launched at the Maizuru Navy Yard on June 26.

Length	feet	320
Beam	do	39¼
Displacement	tons	1,345
Speed	knots	34
Complement		148
Armament:		
4.7		4
Machine guns		4
Torpedo tubes (3 double-barreled tubes)		6
Searchlights		2

Curtis turbine of newest type.

SCOUT CRUISERS FOR RUMANIA BUILT IN ITALY.

Source: Reliable.

(7137)

8 June, 1920.

It has been ascertained at the ministry that the scouts *Nibbio* and *Sparviero*, built in Italy for the Rumanian Government just before the outbreak of hostilities, are about to be delivered to the owners and to be paid for with gasoline from Rumania. These scouts formed part of the Italian fleet during the war and rendered valuable service.

LIGHT CRUISER "OI," LAUNCHING OF.

Source: Reliable.

(12875)

27 July, 1920.

The launching of the Japanese light cruiser *Oi* was safely made July 15 at the Kowasaki Dockyard. The *Oi* is a cruiser of 5,500 tons, with a speed of 35 knots, and said to be the fastest ship in the Japanese Navy. Her keel was laid in November of last year.

ORDNANCE.

ORDNANCE NOTES ON ITALIAN BATTLESHIP "CONTE DI CAVOUR."

Source: Lieut. Commander A. H. Gray, United States Navy.

23 September, 1919.

The turret visited was a three-gun turret 12-inch 46 caliber. Each gun was in a separate slide and had its own pointer. The gunnery officer stated that experiments had shown that a smaller pattern was obtained in this manner and that at 18,000 yards a three-gun turret gave a pattern of only 50 yards.

Pointers sights were telescopic, not prismatic.

Firing.

All firing was done by the center gun pointer who simultaneously pulled a mechanical firing lever and pressed an electric trigger. Both hands, of course, were used in this operation and it was available only when guns were set for director firing, in which case a gun layer not at the telescope followed the pointer.

Twin firing circuits in parallel are used and both operate simultaneously. Closing the plug does not of itself close the circuit. A hand switch in each case must be closed by the plugman.

The lock is a magazine lock containing three primers which may be changed without opening the breech. A small twine basket is fitted in rear of eack lock into which used primers are automatically ejected.

In addition to the primer an auxiliary primer is used. This consists of a muslin bag containing fine black powder about $3\frac{1}{2}$ inches in diameter by $\frac{3}{16}$ inch thick, the bag being secured to the mushroom face by a quill which is a part of the auxiliary primer and is placed in the vent. The gunnery officer claimed that this auxiliary reduced the firing interval and that he had never heard of a misfire or hangfire with this type of mechanism.

Stand-by firing signals are given by buzzer, firing signals by gong. These signals are sent out from the plotting room.

Loading.

The rammer is on an extension arm of the sleeve, and the ammunition car locks relative to the rammer, so that the gun may be loaded in elevation.

The loading tray is operated by a cam on the ammunition car and works automatically when the car is raised or lowered.

The hoist is of the two-stage type. There are two trays for powder and one for shell as in old type United States hoists.

Rammer man sits in a chair in rear of gun and is the man who reports the bore clear of gas.

Plugs are operated by a vertical motor at side of gun working through shafting and spur gears. Operation is rather slow—estimated at 3½ seconds to open plug.

In addition to regular hoists an auxiliary tube hoist hydraulically operated is fitted for shell only. Only one type of shell is used, armor-piercing. This shell is said to weigh 900 pounds and to contain a bursting charge of 28 kilos (61.8 pounds) of trotyl. The cap is larger than in our shell and less pointed.

Some shrapnel and high-explosive shells were said to have been tried out in similar guns on shore, but are not used afloat.

Elevating and Training.

Gun elevation is hydraulic and in duplicate for each gun. A pressure of 65 K. per square centimeter (920 pounds) was used, but from calibration of gauges, I gathered that about 1,600 pounds was used under operating conditions. The hydraulic system is generally the favorite in the Italian Navy, but at least one of their new ships is fitted with electric gear. In some of their installations it was found that the pumps furnishing the power were inadequate, and that therefore only half the broadside could be operated simultaneously. For turret training a hydraulic system was the main reliance, but an electric system consisting of a Vicker's motor of about 20 horsepower, working through an oil reduction gear, was fitted as an auxiliary.

In general it was noted that all material was substantial and showed careful workmanship and design. Great care was taken in fitting guardrails and screens around moving parts. Condition of material was excellent. Only partial bulkheads were fitted between guns, but ammunition system was such as to insure against a turret fire being communicated to the magazines.

Loading time appeared to be slower than with our 12-inch guns. Present practice is to fire all guns simultaneously every 45 seconds and loading is sufficiently fast to suit gunnery officer. If a turret fails to fire it is necessary to wait 45 seconds until the next complete salvo.

The development of spotting and plotting systems in the Italian Navy is recent, but their plotting room gives evidence of considerable care and thought.

The main reliance is placed on range finders' readings. Three triple range finders are used, and the readings show up on visuals in

plotting station. One man makes three different-colored dots on a paper roll by means of reach rods as the paper is rolled up and other sets of dots made. Another man seated at the board notes the inclination of the line of dots, which is automatically read off as a rate of change of range. The range as corrected for rate of change and other corrections is transmitted mechanically to the guns. An anemomemeter in the top records the apparent wind, divided into "range" and "deflect" components. Each of these factors is given to a special operator at a small board with curves laid off which translate these factors into changes to be applied to range and deflection. Through gearing these factors are applied to the range visuals and transmitted as part of the range. Similar corrections are made for speed and course of vessel.

THE FOLLOWING INFORMATION WAS OBTAINED IN CONVERSATION WITH A BRITISH NAVAL OFFICER.

Source: Reliable.

(5960)

18 August, 1920.

Fifteen-inch guns are the largest guns being built in England to-day. It was his personal opinion that the limit in size of guns and ships had been almost reached and that large ships and guns placed too many eggs in one basket. It is considered that the expense of such ships and guns is a great factor in England, where, due to the great number of stations to be manned, the small ships and guns give them a better return for their money. In addition, it is a question whether England can afford to go ahead with the development of larger guns in view of the present condition of their treasury. This officer did not state that no work had been undertaken on plans for 18-inch or 20-inch guns, but it was inferred that no work toward their construction was being carried out.

Twelve-inch guns mounted on submarines can now be loaded submerged. The gun can be fired on the surface, boat submerged, gun loaded, and boat brought to the surface ready for firing again in three minutes. It is understood that guns mounted on the submarines during the war could not do this. There are, apparently, no changes in the method of placing the gun on the target in train. Submarines with the 12-inch guns mounted on them were originally built for work in the Dardanelles. It was planned to go into Constantinople with them and bombard that city. Also, further use for them was expected in fleet actions and in the bombardment of the Belgian and other coasts.

EXPENDITURE OF ARTILLERY AMMUNITION IN MODERN BATTLES.

Source: Ordnance Department of the Army.

One of the most striking developments of the World War was the great increase in the use of artillery to precede infantry action in battle. This is illustrated by a comparison of the expenditure of artillery ammunition in characteristic battles of recent wars with that in important battles of the World War. The special features of the several battles should be kept in mind. Chickamauga was fought in a heavily wooded region, Gettysburg and St. Privat over open farm land. The latter battles, together with Nan Shan and all the battles of the World War considered below, involved artillery preparation for assault upon armies in defensive position. The expenditures, therefore, are roughly comparable.

The high mark of the use of artillery in offensive battle was reached at the Somme and Messines Ridge, before the effective use of tanks was developed.

Year.	Battle.	Days' duration.	Army.	Rounds of artillery ammunition expended.
1863	Chickamauga	2	Union	7,325
1863	Gettysburg	3	do	32,781
1870	St. Privat	1	German	39,000
1904	Nan Shan	1	Japanese	34,047
1904	Liao Yang	9	Russian	134,400
1904	Sha Ho	9	do	274,360
1915	Neuve Chapelle	[1] 3	British	197,000
1915	Souchez	[2] 1	French	300,000
1916	Somme	[3] 7	British	4,000,000
1917	Messines Ridge	[3] 7	do	2,753,000
1918	St. Mihiel	[2] 4	United States	1,093,217

NOTE.—Artillery preparation lasted: (1) 35 minutes, (2) 4 hours, (3) intermittent 7 days.

EXPENDITURE OF ARTILLERY AMMUNITION IN RECENT WARS.

Source: Ordnance Department of the Army.

The industrial effort necessary to maintain modern armies in action may be measured to a certain extent by their expenditure of artillery ammunition. European wars of the past 100 years were for the most part decided before peace-time reserves had been exhausted. The American Civil War, however, required for its decision an industrial mobilization at that time unprecedented, which, like the use in that war of intrenchments by field armies, was more truly indicative of the trend of modern warfare than were the conditions of the more recent European wars.

Previous wars compared with one month of World War.

Year.	War.	Army.	Rounds expended during war.
1859	Italian	Austrian	15,326
1861–1865	Civil	Union	5,000,000
1866	Austro-Prussian	Prussian	36,199
		Austrian	96,472
1870–71	Franco-Prussian	German	817,000
1904–5	Russo-Japanese	Russian	954,000
1912–13	Balkan	Bulgarian	700,000
1918	World War	British and French	[1] 12,710,000

[1] One month, average, year ended Nov. 10, 1918.

Expenditures for one year, Civil and World War.

Year.	War.	Army.	Rounds expended for one year.
1864 [1]	Civil	Union	1,950,000
1918 [2]	World War	United States	8,100,000
1918 [2]	do	British	71,445,000
1918 [2]	do	French	81,070,000

[1] Year ended June 30, 1864. [2] Year ended Nov. 10, 1918.

RATES OF ARTILLERY FIRE PER GUN PER DAY IN RECENT WARS.

Source: Ordnance Department of the Army.

The rates are based upon total expenditure and average number of guns in the hands of field armies for the period of the wars.

A large part of the heavy expenditure of artillery ammunition in the World War as compared with other modern wars can be attributed to the increased rate of fire made possible by improved methods of supply in the field and by the rapid-fire guns now in use. In wars fought before the introduction of quick-firing field guns, four or five rounds per day was the greatest average rate. Even this was reached only in the siege of Sebastopol, where armies were stationary and supply by water was easy, and in the American Civil War, which was characterized by advanced tactical developments. The guns of the allied armies in France fired throughout the year 1918 at a rate about seven times greater than these previously high rates.

War.	Army.	Approximate rounds per gun per day.
Crimean, 1854–1856	British and French	[1] 5.0
Italian, 1859	Austrian	.3
Civil, 1861–1865	Union	4.0
Austro-Prussian, 1866	Austrian	2.2
	Prussian	.8
Franco-Prussian, 1870–71	German	[2] 1.1
Russo-Japanese, 1904–5	Russian	4.0
Balkan, 1912–13	Bulgarian	7.0
World War:		
September, 1914	French	[2] 8.0
Jan. 1 to Oct. 1, 1918	Italian	[2] 8.0
Jan. 1 to Nov. 11, 1918	United States	[2] 30.0
Do	French	[2] 34.0
Do	British	[2] 35.0

[1] Siege of Sebastopol.

[2] Field gun ammunition only.

COMMUNICATIONS.

WIRELESS COMMUNICATIONS (FRENCH RADIO STATIONS).

Source: Reliable.

(12034)

3 July, 1920.

Under Secretary of State for the Post, Telegraph, and Telephone Services Deschamps has announced that the French Government plans for an elaborate wireless system whose center will be in Paris and which will cover Europe, Asia, Africa, and South America, and connect with North America. If this system, part of which is already in existence, is integrally applied as now proposed, France's wireless communications throughout the world will be able to rival with Great Britain's cable communications. According to the details made public by M. Deschamps at a recent meeting at Rennes, wireless communications was established with Hungary May 20, 1920, and will soon be opened with Belgrade. For commercial communication with the United States there is to be a station at Doua, near Lyons, in addition to that in construction at Croix-d'Hins, near Bordeaux. Between France and her colonies there will be stations with a range of 7,500 miles at Saigon and at Tahiti. Stations with a radius of at least 4,375 miles will be established at Djibouti, Tananarive, Noumea, and French Martinique, also secondary stations at Pondichery and French Guiana. In Africa, the system will include stations at Saida and Bamako which will take care of the traffic between Paris, Algeria, and West Africa, another station in Senegal, near Dakar, and finally that of Brazzaville. The stations of Saida, Bamako, Brazzaville, Tananarive, and Saigon are, at present, in course of construction. The other stations will be commenced after the vote of Parliament on the project of law which M. Deschamps will bring before it in a few days.

GERMAN IMPROVEMENT IN LONG-DISTANCE TELEPHONING.

Source: Reliable.

(13301)

10 June, 1920.

The Wireless Telephone Co. of Germany recently demonstrated before an invited audience a new apparatus that makes it possible to carry on three different telephone conversations at the same time

over the same wire. The construction of this novel apparatus is based on a vacuum tube feature, as invented by Dr. Alexander Meissner. The construction appears very simple.

The introduction of this apparatus, it is claimed by its inventor, will lead to an increase by three times the present capacity of the present German telephone system, without having to erect more poles or string more wires. The postal authorities who administer the telephone system in Germany have ordered 50 complete sets for Government use. It is claimed that this principle is applicable to the telegraph and a trial connection has been established between Berlin and Frankfort-on-the-Main. At the exhibition a new "high-frequence telephone," by which electric power plants may communicate one with another by making use of high-power wires, was also exhibited.

WIRELESS TELEPHONES IN THE JAPANESE NAVY.

Source: Reliable.

(4934-A)

23 June, 1920.

Capt. Nomura, secretary to the minister of marine, has announced that the tests of wireless telephones have been so successful that all the ships of the first squadron have now been equipped with them, and other major ships will be so equipped in the near future.

Dates for completion of vessels.

BATTLESHIPS.

North Dakota	New York	Oct. 15.	Mississippi	Puget Sound	Oct. 1.
Tennessee	do	Sept. 15.	Texas	do	Do.
Louisiana [1]	Philadelphia	Indefinite.			

CRUISERS AND GUNBOATS.

Huntington [2]	Portsmouth	Indefinite.	Denver	Mare Island	Indefinite.
Paducah	do	Oct. 15.	Charleston	Puget Sound	Do.
Chester (res.)	Boston	Indefinite.	Missoula (ex-Montana).	do	Do.
Dolphin	do	Oct. 1.			
Niagara	New York	Not set.	Charlotte (ex-N. Carolina).	do	Do.
Columbia	Philadelphia	Sept. 13.			
Pueblo [2]	do	Indefinite.	Seattle	do	Do.
Brooklyn	Mare Island	Do.			

DESTROYERS.

Colhoun	Portsmouth	Indefinite.	A. P. Upshur (fit. out).	Norfolk	Indefinite.
Fairfax	do	Aug. 28.			
Israel (res.)	do	Indefinite.	Balch (res.)	do	Do.
McKee (res.)	do	Do.	Benham (res.)	do	Do.
Ringgold (res.)	do	Do.	Branch (fit. out)	do	Do.
Robinson (res.)	do	Do.	Clemson (res.)	do	Do.
Stevens	do	Do.	Connor (res.)	do	Do.
Taylor (res.)	do	Do.	Dallas (fit. out)	do	Do.
Case	Boston	Do.	Downes (res.)	do	Do.
Conyngham (res.)	do	Do.	Duncan (res.)	do	Do.
Cowell (res.)	do	Do.	Herndon (fit. out)	do	Do.
Foote (res.)	do	Do.	Hunt (fit. out)	do	Do.
Isherwood	do	Do.	Parker (res.)	do	Do.
Kalk (res.)	do	Do.	G. E. Badger	do	Aug. 28.
Kimberly (res.)	do	Do.	Aaron Ward	Mare Island	Indefinite.
Luce (res.)	do	Do.	Buchanan	do	Do.
Maddox (res.)	do	Do.	Chauncey	do	Do.
Meredith (res.)	do	Do.	Evans	do	Do.
Sharkey	do	Do.	Farquar	do	Sept. 11.
Abbott	New York	Sept. 18.	Kilty	do	Indefinite.
McDougal (res.)	do	Aug. 31.	Litchfield (fit. out)	do	Do.
Sampson	do	Indefinite.	Philip	do	Do.
Tattnall	do	Do.	Thornton	do	Do.
Biddle	Philadelphia	Sept. 1.	Wickes	do	Do.
Bulmer (fit. out)	do	Indefinite.	Woolsey	do	Do.
Harding	do	Oct. 1.	Dent (res.)	Puget Sound	Nov. 15.
Humphreys	do	Indefinite.	Dorsey (res.)	do	Nov. 30.
McLeish	do	Do.	Edwards (res.)	do	Dec. 15.
Overton	do	Do.	Rathburne	do	Nov. 30.
Shaw	do	Do.	Talbot (res.)	do	Do.
J. F. Talbot	do	Do.	Waters (res.)	do	Do.

SUBMARINES AND SUBMARINE TENDERS.

S-3	Portsmouth	Oct. 1.	K-1, 2, 3, 4, 5, 6, 7, 8	Philadelphia	Indefinite.
S-4	do	Sept. 15.	AA-1	Norfolk	Do.
O-1, 4	Boston	Nov. 3.	Bushnell	do	Do.
Rainbow	do	Oct. 9.	Eagle No. 17	do	Do.
Savannah	do	Indefinite.	L-3, 9	do	Do.
Eagle No. 25	Philadelphia	Do.	H-4, 6, 8, 9	Mare Island	Sept. 15.

FLEET TENDERS (train).

Cormorant	Portsmouth	Indefinite.	Nereus	Norfolk	Oct. 10.
Rappahannock(res)	do	Oct. 1.	Teal	Charleston	Indefinite.
Robin	New York	Indefinite.	Comfort (Ord.)	Mare Island	Do.
Lebanon	Norfolk	Sept. 10.			

[1] To be placed out of commission.

[2] To be placed out of commission Nov. 15.

Dates for completion of vessels—Continued.

MINE FORCE (in reserve).

Auk	Portsmouth	Indefinite.	Woodcock	Portsmouth	Indefinite
Curlew	do	Do.	Tanager	Charleston	Do.
Flamingo	do	Do.	Turkey	do	Do.
Grebe	do	Oct. 15.	Whippoorwill	do	Sept. 4.
Osprey	do	Indefinite.	Widgeon	do	Indefinite.
Swan	do	Do.	Pigeon	Mare Island	Aug. 31.

MISCELLANEOUS.

Patuxent	Portsmouth	Indefinite.	Hannibal (res)	Philadelphia	Dec. 15.
Aramis	New York	Do.	Conestoga	Norfolk	Indefinite.
Nokomis	do	Do.			

N. O. T. S.

Long Beach	Portsmouth	Oct. 1.	Hancock	Philadelphia	Oct. 1.
Henderson	Philadelphia	Oct. 2.	Gulfport	Charleston	Aug. 31.
Caesar	Norfolk	Indefinite.	Houston	Mare Island	Indefinite.

EAGLE BOATS.

Eagle No. 43	New Orleans	Nov. 4.	Eagle No. 51	Portsmouth	Sept. 30.
Eagle No. 53	do	Oct. 25.	Eagle No. 54	do	Do.
Eagle No. 36	Portsmouth	Sept. 1.	Eagle No. 57	Puget Sound	Indefinite.

AUGUST 20, 1920.

UNITED STATES SHIPPING BOARD.

Otsego	Portsmouth	Indefinite.	Chautauqua	New York	Indefinite.
Peacock	do	Do.	Lake Deval	do	Do.
Black Arrow	Boston	Do.	Warbler	Philadelphia	Do.
Geo. Washington	do	Do.	Willet	do	Do.
Agamemnon	New York	Do.			

AUGUST 6, 1920.

BATTLESHIPS OUT OF COMMISSION.[3]

Coast B. S. No. 1	Philadelphia.	Missouri	Philadelphia.
Coast B. S. No. 2	Do.	Rhode Island	Mare Island.
Alabama	Do.	Vermont	Do.
Illinois	Do.	Wisconsin	Philadelphia.
Kearsarge	Do.	Nebraska	Mare Island.
Kentucky	Do.	Georgia	Do.
New Jersey	Boston.	Virginia	Boston.
Maine	Philadelphia.		

BATTLESHIPS UNDER REDUCED COMMISSION.

Louisiana [1] ..... Philadelphia.

CRUISERS, GUNBOATS, AND MISCELLANEOUS OUT OF COMMISSION.

Dubuque [4]	Portsmouth.	Topeka	Charleston.
Isabel	Philadelphia.	Monadnock [5]	Olongapo.
Ozark [3]	Do.	Castine [5]	New Orleans.
Tonopah [3]	Do.	Cincinnati [5]	Do.
Yankton [5]	Do.	Petrel [5]	Do.
Jupiter [6]	Norfolk.	Wheeling	Do.
Standish [5]	Do.	Bay Ocean [5]	Mare Island.
Wasp [5]	Do.	Machias [5]	Do.
Winchester [5]	Do.	Marblehead [3]	Do.
Nashville [3]	Charleston.	Supply	Do.
Raleigh [5]	Do.	Yorktown [5]	Do.

[1] To be placed out of commission.
[3] No work being done.
[4] General repairs.
[5] To be sold.
[6] Conversion into aeroplane carrier.

Dates for completion of vessels—Continued.

TORPEDO BOATS OUT OF COMMISSION.

C. T. B. No. 6 (Morris)	Newport.	C. T. B. No. 16 (Thornton)[3] [5]	Norfolk.
Hopkins [5]	Philadelphia.		

EAGLE BOATS IN ORDINARY.

At Portsmouth.

Eagle No. 1.	Eagle No. 26.	Eagle No. 46.[7]
Eagle No. 2.	Eagle No. 27.	Eagle No. 48.
Eagle No. 3.	Eagle No. 28.	Eagle No. 50.
Eagle No. 5.	Eagle No. 29.	Eagle No. 51.
Eagle No. 9.	Eagle No. 36.	Eagle No. 52.
Eagle No. 13.	Eagle No. 37.	Eagle No. 54.[7]
Eagle No. 18.	Eagle No. 41.	Eagle No. 55.
Eagle No. 19.	Eagle No. 42.	Eagle No. 56.[7]
Eagle No. 23.[7]	Eagle No. 44.	Eagle No. 59.
Eagle No. 24.	Eagle No. 45.	

SUBMARINES OUT OF COMMISSION.

U-117 [8]	Philadelphia.	UC-97 [8]	Chicago.
U-140 [8]	Do.	UB-88 [8]	San Pedro.
UB-148 [8]	Do.	U-111 [8]	Portsmouth.
G-1 [9]	Do.		

SUBMARINES AND SUBMARINE TENDERS IN RESERVE.

D-1, 2, 3 [10]	New London.	K-1, 2, 3, 4, 5, 6, 7, and 8 [11]	Philadelphia.
Eagle No. 33	Do.	E-1 and 2	Hampton Roads.
Fulton	Do.	Eagle No. 17	Do.
G-3 [10]	Do.	L-1, 2, 3, 4, 9, 10, 11	Do.
N-1, 2, 3, 4, 5, 6, 7 [10]	Do.	M-1	
Eagle No. 25	Philadelphia.	F-2, 3 [12]	San Pedro.

SUBMARINES IN ORDINARY.[3]

A-3, 5	Cavite, P. I.	B-3	Cavite, P. I.

VESSELS TO BE PLACED OUT OF COMMISSION IN NEAR FUTURE.

Warbler	Philadelphia.	Quiros [5]	Asiatic station.
Elcano [5]	Asiatic station.	Samar [5]	Do.
Pampagna [5]	Do.	Villalobos [5]	Do.

REDUCED COMMISSION OR ORDINARY.[4]

Rappahannock	Portsmouth.	Hannibal	Philadelphia.
Chester	Boston.	Comfort	Mare Island.
Caesar	Norfolk.		

DESTROYERS OUT OF COMMISSION.

At Philadelphia.

Ammen.	Jenkins.	Perkins.
Beale.	Jouett.	Roe.
Burrows.	Mayrant.	Sterrett.
Drayton	McCall.	Terry.
Fanning.	Monaghan.	Trippe.
Henley.	Patterson.	Walke.
Jarvis.	Paulding.	Warrington.

[3] No work being done.
[4] General repairs.
[5] To be sold.
[7] In full commission.
[8] Being dismantled.
[9] Target for depth charge experiments.
[10] S/M School, experimental and development work.
[11] Under repairs.
[12] Elemental S/M school work.

Summary by navy yards of ships under repair.

PORTSMOUTH, N. H.

Huntington	Indefinite.
Paducah	Oct. 15.
Colhoun	Indefinite.
Fairfax	Aug. 28.
Israel (res.)	Indefinite.
McKee (res.)	Indefinite.
Ringgold (res.)	Indefinite.
Robinson (res.)	Indefinite.
Stevens	Indefinite.
Taylor (res.)	Indefinite.
S-3	Oct. 1.
S-4	Sept. 15.
Cormorant	Indefinite.
Rappahannock (res.)	Oct. 1.
Auk (res.)	Indefinite.
Curlew (res.)	Indefinite.
Flamingo (res.)	Indefinite.
Grebe (res.)	Oct. 15.
Osprey (res.)	Indefinite.
Swan (res.)	Indefinite.
Woodcock (res.)	Indefinite.
Patuxent	Indefinite.
Long Beach	Indefinite.
Eagle No. 36	Sept. 1.
Eagle No. 51	Sept. 30.
Eagle No. 54	Sept. 30.
Otsego	Indefinite.
Peacock	Indefinite.

BOSTON.

Chester (res.)	Indefinite.
Dolphin	Oct. 1.
Case	Indefinite.
Conyngham (res.)	Indefinite.
Cowell (res.)	Indefinite.
Foote (res.)	Indefinite.
Isherwood	Indefinite.
Kalk (res.)	Indefinite.
Kimberly (res.)	Indefinite.
Luce (res.)	Indefinite.
Maddox (res.)	Indefinite.
Meredith (res.)	Indefinite.
Sharkey	Indefinite.
O-1, 4	Nov. 3.
Rainbow	Oct. 9.
Savannah	Indefinite.
Black Arrow	Indefinite
George Washington	Indefinite.

NEW YORK.

North Dakota	Oct. 15.
Tennessee	Sept. 15.
Niagara	Not set.
Abbott	Sept. 18.
McDougal (res.)	Aug. 31.
Sampson	Indefinite.
Tattnall	Indefinite.
Robin	Indefinite
Aramis	Indefinite.
Nokomis	Indefinite.
Agamemnon	Indefinite.
Chatauqua	Indefinite.
Lake Deval	Indefinite.

PHILADELPHIA.

Louisiana	Indefinite.
Columbia	Sept. 13.
Pueblo	Indefinite.
Biddle	Sept. 1.
Bulmer (fit. out)	Indefinite.
Harding	Oct. 1.
Humphreys	Indefinite.
McLeish	Indefinite.
Overton	Indefinite.
Shaw	Indefinite.
J. F. Talbot	Indefinite.
Eagle No. 25	Indefinite.

PHILADELPHIA—continued.

K-1, 2, 3, 4, 5, 6, 7, 8	Indefinite.
Hannibal (res.)	Dec. 15.
Henderson	Oct. 2.
Hancock	Oct. 5.
Warbler	Indefinite.
Willet	Indefinite.

NORFOLK.

A. P. Upshur (fit. out)	Indefinite.
Balch (res.)	Indefinite.
Benham (res.)	Indefinite.
Branch (fit. out)	Indefinite.
Clemson (res.)	Indefinite.
Connor (res.)	Indefinite.
Dallas (fit. out)	Indefinite.
Downes (res.)	Indefinite.
Duncan (res.)	Indefinite.
G. E. Badger	Aug. 28.
Herndon (fit. out)	Indefinite.
Hunt (fit. out)	Indefinite.
Parker (res.)	Indefinite.
Eagle No. 17	Indefinite.
AA-1	Indefinite.
Bushnell	Indefinite.
L-3-9	Indefinite.
Lebanon	Sept. 10.
Nereus	Oct. 10.
Conestoga	Indefinite.
Caesar	Indefinite.

CHARLESTON.

Teal	Indefinite.
Tanager (res.)	Indefinite.
Turkey (res.)	Indefinite.
Whippoorwill (res.)	Sept. 4.
Widgeon (res.)	Indefinite.
Gulfport	Aug. 31.

MARE ISLAND.

Brooklyn	Indefinite.
Denver	Indefinite.
Aaron Ward	Indefinite.
Buchanan	Indefinite.
Chauncey	Indefinite.
Evans	Indefinite.
Farquhar	Sept. 11.
Kilty	Indefinite.
Litchfield	Indefinite.
Philip	Indefinite.
Thornton	Indefinite.
Wickes	Indefinite.
Woolsey	Indefinite.
H-4, 6, 8, 9	Sept. 15.
Comfort (Ord.)	Indefinite.
Pigeon (res.)	Aug. 31.
Houston	Indefinite.

NEW ORLEANS.

Eagle No. 43	Nov. 4.
Eagle No. 53	Oct. 25.

PUGET SOUND.

Mississippi	Oct. 1.
Texas	Oct. 1.
Charleston	Indefinite.
Missoula	Indefinite.
Charlotte	Indefinite.
Seattle	Indefinite.
Dent (res.)	Nov. 15.
Dorsey (res.)	Nov. 30.
Edwards (res.)	Dec. 15.
Rathburne	Nov. 30.
Talbot (res.)	Nov. 30.
Waters (res.)	Nov. 30.
Eagle No. 57	Indefinite.

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SUBMARINES.

EX-GERMAN SUBMARINE "U–135."

Source: Commander E. S. Land (C. C.), U. S. Navy.

(12630.)

11 August, 1920.

The following reports give detailed information relative to the results obtained on this vessel during the trials conducted by the British.

It is of interest to note that the trials referred to herein were conducted by the submarine experts of the British Navy. The *U–135* was considered by the Germans as "the last word" in submarine construction at the time she was completed. This vessel was the first one selected by the British from the submarines surrendered at Harwich, and this vessel has been given more thorough trials than any other of the ex-German submarines.

Notes During Diving Trial on 5 January, 1920, and Summary of Records Taken.

1040. Dived 12 meters[1] and adjusted trim, remaining submerged until 1615.

Carried out measured mile runs and turning trials.

1430. The port main motor appeared to develop defects and was not used for the rest of the day.

Due to reduction in speed, the boat became unmanageable and appeared very heavy forward. The bubble went off the board (estimated 15°) and the boat sank to 22 meters[1] before she could be stopped by blowing first Nos. 6 and 7 main ballast tanks and then the forward group.

All auxiliary tanks affecting the trim were then sounded and it was found that no alteration had taken place in the trimming tanks, but it appeared as if the amount in the regulating tanks had increased slightly since first diving.

To rectify the trim about 2,500 liters[2] were pumped out of the regulating tanks by the rotary pump and 800 liters[2] transferred from forward to after trimming tanks.

Experience has shown that where in the average British submarine a small amount of helm is necessary to correct an inclination, in the *U–135* nearly three times this angle should be used and it is therefore

[1] 1 meter=39.37 inches.

[2] 3.7853 liters=1 gallon.

very necessary that the men working the planes should know this and have a good knowledge of the boat's behavior submerged and that the crew should not move about with the same freedom allowed in a British submarine.

The unhandiness is considered to be due to the comparative small area of hydroplanes to length of boat and to her upper deck.

The boat was next taken down slowly and the motor stopped at 20 meters. She rested comfortably on the bottom on an even keel in 28 meters (110 feet) at an angle of $1\frac{1}{2}°$ up by the bow.

The port forward regulating tank was then flooded and pumped out by the rotary pump on its high capacity setting (0–30 meters), which lifted the boat's stern clear of the bottom.

At 1605, blew Nos. 6 and 7 main ballasts and brought the boat up to 6 meters.

1615. *Surface.*—Blew all main ballast tanks with rotary blower.

Continued to use the starboard motor on return to harbor in order to complete the discharge of the battery. Stopped at 1740.

"U–135" Measured Mile Records Submerged.

First speed.—Main motors at full fields in parallel. Boat at periscope depth (12–13 meters).

	Course.	Time.	Speed.	Revs.	
				Port.	Starboard.
a. m.	°	*m. s.*	*Knots.*		
1045	266	10 21.6	6.6	.....	.....
1115	86	15 42	4.4	194	197
1147	266	10 27	6.5	200	198
		Means	5.5	197	

Main motors discharging at 800 amperes each = 3,200 total. Voltage, 245. El. H. P., 1,050.

Second speed.—Main motors in parallel at normal full speed. Depth keeping slightly erratic.

	Course.	Time.	Speed.	Revs.	
				Port.	Starboard.
a. m.	°	*m. s.*	*Knots.*		
1215	86	11 22	6.06	250	252
1235	266	8 33.8	8.07	245	248
		Means	7.06	249	

Main motors discharging at 1,450 amperes each = 5,800 total. Voltage, 210. El. H. P., 1,635.

"U-135"—Turning Trials Submerged.

Starting times were taken when ship had swung a few degrees off her original course.

First turn.—Both motors at full fields in parallel, about 195 revolutions. Helm hard a starboard (30½°).

	m.	s.
Time to turn through 90°	1	49
Time to turn from 90° to 180°	1	30
	3	19

Second turn.—Outer screw at normal full speed, 252 revolutions. Inner screw at full fields, 195 revolutions. Helm hard a starboard.

	m.	s.
Time to turn through 90°	1	32
Time to turn from 90° to 180°	1	32
	3	4

Third turn.—Both motors at normal full speed, about 250 revolutions. Helm hard a starboard.

	m.	s.
Time to turn through 180°	2	56
First turn.....per degree..	1.	1
Second turn.....do....	1.	02
Third turn.....do....	.	97

The boat showed a slight tendency to come up during each turn but was easily controlled.

Tactical diameters.—Calculated from the above times and assuming ship's path is a true circle and the average reduction of speed 10 per cent of the original:

	Yards.
First turn	365
Third turn	403

"U-135"—Remarks on Main Motor Cooling Installation.

The attached record below of temperature taken in the motor room during the 5½ hours submerged shows clearly the efficiency of the cooling water system in keeping down the temperature of the motors.

It is observed that the temperature of the motor room shows a steady rise from 60° to 90° in the first two hours, during one and one-half hours of which the motors were running at full fields and for the last half hour at normal full speed.

One fan was started on each side during the middle of this period without arresting the rise of temperatures. When, however, the cooling water system was started after this a rapid reduction in temperature (10° in the first 10 minutes) immediately took place, and from that time to the completion of the dive the temperature was steadily reduced.

The net rise of temperature during the whole dive was only 10°, and had the cooling system been run from the commencement it would probably have been nil.

It may be noted that the motor bearing temperatures (schedule herewith) were affected in the same advantageous way by the effect of the cooling installation.

[Temperature of the sea, 48° F.]

Time.	Temperature.	Remarks.
	°F.	
1045	60	Fans and cooling water *not* running. Dived.
1105	61.5	
1123	63	
1145	65	
1155	68	One fan each side started on both motors.
1215	75	Both motors, 1,450 amperes on each for half an hour.
1220	78	
1230	80	
1233	82	
1240	84	Started second fan on each motor.
1242	88	
1250	90	Started water cooling on each motor. Both motors, 800 amperes on each.
1300	80	
1307	78	
1325	76	
1340	78	Motors, 900 amperes on each.
1350	76	At 1400 cooling water stopped; 1410 restarted.
1415	75	
1430	74	
1445	74	At 1615 came to the surface.
1600	71	
1815	70	

"U–135"—Hydroplanes in Hand Gear.

Changing from power to hand gear.—This operation was quickly and easily carried out by means of the air-operated clutches. The hand clutch could, however, engage itself in gear owing to a leak in the air system.

Changing from hand gear to power.—This operation could only be done by hand and consumed an appreciable length of time, as it required the assistance of an additional man to pull over the clutch lever.

Working in hand.—This was tried on both planes separately, and the boat was kept under control without any difficulty at 5½ knots. One man was able to work the wheel with little effort. About 100 turns of the wheel were required to put the helm from right full to left full.

The forward planes were also worked from the wheel in the fore compartment, the whole of the shafting abaft this being then dis-

engaged. For this reason less effort was required than at the control room position.

The movements of the planes were regulated from the control room by electrical order instrument of "follow the pointer" system. This appeared to be quite a satisfactory method.

"U-135"—Trial of Rotary Pump at 28 Meters (110 feet).

The pump was run on its high capacity setting (0–30 meters), the depth at the time being 28 meters.

Current taken	amperes	220
Voltage	do	225
El. H. P	do	66.5

9,800 liters were pumped out in 3m. 39s. Capacity, 2,690 liters per minute, or 163 tons per hour.

Previous trial on the surface gave—

Current taken	amperes	220
Voltage	do	255
El. H. P	do	75.2

Capacity, 408.7 tons per hour.

The middle auxiliary pump (bilge) was also tried at this depth and successfully pumped out the control room bilge.

"U-135"—Remarks on the Bahavior of Batteries.

The records taken are shown below.

Before diving the battery was fully charged, showing a voltage of 280, or 2.26 per cell with no discharge.

The after battery was at 61° temperature and the forward at 68°.

The general rate of discharge during the dive was at approximately 3,200 amperes, corresponding to 1,067 amperes from each battery.

A complete record of densities was not obtained on this occasion, but a careful watch was kept on the voltage, which dropped to its lowest reading of 200, or 1.62 per cell, during a discharge of 5,800 amperes, or 1,933 amperes each battery.

At the end of the day the voltage with no discharge was 235, or 1.9 per cell, and the densities were below the scale readings of the hydrometer.

The rise of the temperature was about 15° in all batteries.

To measure the output, the records account separately for the discharge of each pair of main motors and auxiliary machinery, giving a total of 14,310 ampere-hours, or 4,770 ampere-hours per battery.

Judging from the condition of the battery at the end of the day, it was evident that it was not completely run down, although the densities were very low.

It was noticed toward the end of the day on two occasions that the main motors unaccountably slowed up, and it was thought that some defect had developed to cause this. Subsequent trial, however, disproved this, and the slowing up must be attributed to a drop of supply voltage.

Battery records.

	Time.	Density.	Temperature.	Voltage.	Remarks.
			°		
Battery 1.....	1030	1, 238	61. 5	280	
	1130	No reading.	65. 5	270	End of charge. Hydrometer broken; no densities taken until 1815.
	1308		75. 0	.....	
	1415		78. 0	212	
	1510		77. 0	220	
	1815		75. 2	235	
Battery 2.....	1030	1, 220	68. 0	280	
	1130	1, 206	71. 5	240	End of charge. Samples of acid in pilot cells taken at stated times and densities taken on arrival in harbor.
	1250	1, 156	81. 0	220	
	1415	1, 122	83. 0	212	
	1505	No reading.	83. 0	220	
	1815		81. 5	235	
Battery 3.....	1030	1, 228	67. 0	280	
	1130	1, 212	70. 0	.....	
	1150	No reading.	75. 0	.....	End of charge. Hydrometer broken; no densities taken till 1815.
	1250		82. 0	220	
	1415		83. 0	212	
	1505		82. 0	220	
	1815		78. 0	248	

"U–135"—Main Motors, Port and Starboard—Measurement of Capacity.

Time.	Port motors.		Voltage.	Revolutions.	Ampere hours taken out.	Remarks.
	Forward.	Aft.				
1042	800	800	245	205	.....	Ampere hours are calculated for 1 motor only; therefore total multiplied by 2 gives output for port shaft.
1130	600	600	.....	.....	600	
1139	Stop.	Both.	.....	.....	100	
1145	600	600	220	220	200	
1208	1,450	1,450	210	250	750	
1242	500	500	200	183	760	
1420	Stop.	Port.	.....	.....	.....	
Total.	.....	.....	.....	.....	2,410	
1042	800	800	245	197	.....	Ampere hours are calculated for 1 motor only; therefore total multiplied by 2 gives output for starboard shaft.
1133	1,450	1,450	.....	250	700	
1135	Stop.	Stbd.	.....	.....	30	
1137	700	700	.....	.....	.....	
1139	Stop.	Both.	.....	.....	25	
1145	700	700	.....	198	.....	
1200	1,450	1,450	210	250	175	
1242	600	600	200	.....	1,090	
1420	800	800	220	220	1,040	
1430	Stop.	Stbd.	.....	.....	135	
1437	800	800	.....	210	.....	
1440	Stop.	Stbd.	.....	.....	40	
1443	800	800	.....	.....	.....	
1445	Stop.	Stbd.	.....	.....	30	
1505	800	800	.....	210	.....	
1515	650	650	210	.....	135	
1522	Stop.	Stbd.	.....	.....	75	
1602	800	800	.....	.....	.....	
1604	900	900	220	220	25	
1610	Stop.	Stbd.	.....	.....	135	
1612	800	800	.....	.....	.....	
1614	Stop.	Stbd.	.....	.....	75	
1630	800	800	210	220	.....	
1710	Stop.	Stbd.	.....	.....	540	
1712	600	600	.....	.....	.....	
1713	800	800	.....	.....	15	
1718	Stop.	Stbd.	.....	.....	40	
1722	700	700	210	200	.....	
1725	500	500	.....	.....	35	
1726	Stop.	Stbd.	.....	.....	10	
1728	700	700	.....	.....	.....	
1729	Stop.	Stbd.	.....	.....	10	
Total.	.....	.....	.....	.....	...4,380	

"U-135"—Auxiliary Machinery—Measurement of Capacity.

	Current.	Duration.	Ampere hours consumed.
	Amperes.	*H. m.*	
Rotary blower	240	30	120
Cooling motor pump	20	4 00	80
Fans	15	30	7
Rotary pump	210	20	70
Helm and hydroplane motors	.....	.....	[1] 200
Lighting	22	8 00	176
Order instruments	10	8 00	80
	.....	.....	733

[1] Estimated.

Grand totals of consumption:	Ampere-hours.
Port main motors	4,820
Starboard main motors	8,760
Auxiliary machinery (as above)	730
Grand total	14,310

"U-135"—Temperature of Main Motor Bearings.

Time.	Port motors.		Starboard motors.		Remarks.
	Forward.	After.	Forward.	After.	
	° *F.*	° *F.*	° *F.*	° *F.*	
1030	67	67	.....	.....	Temperature inside motor casings, 88° F.
1045	.....	.....	67	67	
1130	91	92	92	92	
1200	106	93	107	95	Motors at full speed for half an hour.
1230	119	104	120	106	Motor casing temperature at 1250, 110° F.
1255	122	108	122	110	Cooling water installation started.
1310	125	108	125	106	Motor casing temperature, 100° F.
1415	125	108	125	110	Motor casing temperature, 90° F.
1520	105	95	112	95	
1610	91	89	91	89	

The temperature noted at 1310 and 1415 may have exceeded the figure given through being the maximum figure of the thermometer used. This high temperature must be attributed to the full speed run between 1200 and 1300, and would probably have been maintained but for the starting of the cooling installation at 1250, which brought the bearing temperatures steadily down until the end of the record, when they stood at a lower figure than their previous maximum at normal speed, viz, 106° F. at noon.

"U-135"—Tests of Atmosphere, 5 January, 1920.

Report upon CO^2 estimation of air samples by naval medical school, Royal Naval College, Greenwich—Analyzed 13 January, 1920.—Samples were taken from the following compartments (*a*) fore end, (*b*) control

room, (*c*) main engine room, and (*d*) crew space at the following times: First sample, 2½ hours after diving; second, 4 hours after diving; and third, 5½ hours after diving. For half an hour before last sample was taken the port ventilating fan was circulating through purifiers. No oxygen, however, was used. Thirty-eight officers and men on board and all active during period of dive.

Bottle No.	Air sample No.	Labeled.	Parts of CO_2 per 10,000 of air.
E. 16	2038	Fore end. 1300, submerged. No fans going. Temp. 53	48.7
G. 6	2039	Control room. 1310, submerged. No fans going. Temp. 63	69.3
C. 12	2040	Main engine room. 1315, submerged. No fans going. Temp. 67	56.7
D. 17	2041	Crew space. 1325, submerged. No fans going. Temp. 67	54.0
A. 1	2042	Control room. 1410, submerged. No fans going. Temp. 59	87.1
A. 53	2043	Crew space. 1440, submerged. No fans going. Temp. 67	75.1
I. 10	2044	Main engine room. 1445, submerged. No fans going. Temp. 67	75.7
E. 7	2045	Fore end. 1445, submerged. No fans going. Temp. 51	69.1
E. 31	2046	Fore end. 1600, submerged. Port ventilating fan circulating air through purifiers. Oxygen apparatus not used. Temp. 57	78.7
X. 6	2047	Main engine room. 1610, submerged. Port ventilating fan circulating air through purifiers. Oxygen apparatus not used. Temp. 66	73.6
C. 23	2048	Control room. 1615, submerged. Port ventilating fan circulating air through purifiers. Oxygen apparatus not used. Temp. 61	104.9
D. 3	2049	Crew space. 1620, submerged. Port ventilating fan circulating air through purifiers. Oxygen apparatus not used. Temp. 60	81.4

NOTE.—Surg.-Capt. D. W. Bassett-Smith remarks that the results would have been more comparable if the samples had been taken from the spaces in the same order and with the same intervals of time between.

"U–135"—Diving Trials, 6 January, 1920.

Dived from full buoyancy; speed 200 revolutions (8 knots on surface and 5½ knots submerged).

Bridge under (10 meters) in 1m. 39s.

Adjusted trim and dived at various depths.

Surface. Established full buoyancy by blower.

Dived by alarm bells; speed 200 revolutions, increased to 250 (10 knots on surface and 7 knots submerged) on opening main vents.

Upper deck awash in 0m. 40s.

Bridge under (10 meters) in 1m. 7s.

Periscope depth (13 meters) in 1m. 52s.

Maximum angle 3°, stern up.

Surface. Established full buoyancy by blower.

Dived by alarm bells; speed 200 revolutions, increased to 250 (10 knots on surface and 7 knots submerged) on opening main vents. The conditions were, therefore, the same as before, except that the boat was taken down at a greater angle.

Upper deck awash in 0m. 30s.
Bridge under (10 meters) in 1m. 0s.
Periscope depth (15 meters) in 1m. 12s.
Maximum angle 8°, stern up.
Steadied at 17 meters.
Reduced speed to 100 revolutions (motors in series at full fields) and with a good trim maintained a steady depth at 17 meters.
Surface. Established full buoyancy by blower.

Dived by alarm bells; speed 250 revolutions (10 knots on surface and 7 knots submerged).

Bridge under (10 meters) in 0m. 30s.
Periscope depth (13 meters) in 1m. 0s.
Maximum angle 11°, stern up.
Steadied at 20 meters (66 feet) in 1m. 20s.
Surface. Full buoyancy. Returned to harbor.

"U–135"—Remarks on the Quantity of Air Required for Coming to the Surface.

The boat was brought up after the first and third dives to a condition when the upper deck was about 1 foot out of water, which may be said to be sufficient for ordinary rough weather. One group of air bottles was reduced 65 atmospheres in pressure to attain this. It may, therefore, be estimated that for a full group of 160 atmospheres this could be done $2\frac{1}{2}$ times, and that the whole capacity for the boat, i. e., 12 groups, would therefore suffice to bring the boat to rough weather buoyancy about 30 times.

In calm weather a reduction of one group by 20 atmospheres is sufficient to bring the boat to a condition when the upper deck is just awash and blower can be started.

Remarks on the Efficiency and use of the Rotary Blower.

The maximum pressure of discharge from the rotary blower is 0.55 kg./sq. cm. (7.5 pounds to the square inch), which corresponds to 16.6 feet of sea water.

The blower seems to have ample capacity, and it is therefore far quicker to blow all main ballast tanks at once than to blow one group at a time, since by this method the difference in level between inside the tanks and outside is kept at the minimum. This difference is $13\frac{1}{2}$ feet as the last main ballast empties.

The best time recorded for blowing all main ballast tanks by blower after H. P. air had been shut off was 4½ minutes.

Capacity of main ballast tanks estimated at 373 tons.
Pressure, 0.46 kg./sq. cm.=14.7 feet of sea water.
Current taken, 525 amperes.
Voltage, 220.
El. H. P., 155.

Calculations based on the capacity of main ballast tanks and the final pressure of the blower give the capacity of the blower as 3,110 cubic feet per minute. The label plate gives 90 cubic meters (3,120 cubic feet).

Periscope Vibrations.

The conning tower periscope vibrations were noted at various speeds and depths, and at no time could they be said to be at all bad.

The emergency periscope in the auxiliary engine room vibrated considerably when below its own periscope depth, but not when its top was above water.

"U-135"—Main Motor Starting and Reversing Trials, 8 January, 1920.

First test.—From "stopped" to "slow ahead" (motors in parallel at full fields.)

	Current at starting.		Maximum current.		Running current.	Time from closing switch to settled current.
	No. 1.	No. 2.	No. 1.	No. 2.		
						Secs.
Starboard motors.....	1,500	1,000	2,000	.....	750	4
	1,700	1,700	2,000	.....	800	3½
Port motors.....	1,200	1,700	1,700	2,000	750	3½
	1,700	1,700	.....	.....	800	3½

Second test.—From "stopped" to "full speed ahead" (motors in parallel at 1,450 amperes each).

	Current at starting.		Maximum current.		Running current.	Time from closing switch to settled current.
	No. 1.	No. 2.	No. 1.	No. 2.		
						Secs.
Starboard motors.....	1,700	1,700	2,000	2,000	1,450	30
	1,500	1,700	.....	2,000	1,450	15½
Port motors.....	1,700	1,700	2,000	2,000	1,450	17

This time is abnormal, due to the motors not having been speeded up at once after the starting resistances were cut out.

Third test.—From "full speed ahead" to "full speed astern."

	Current at starting.		Maximum current.		Running current.	Time from telegraph order to motors going astern at 1,450 amperes.
	No. 1.	No. 2.	No. 1.	No. 2.		
						Secs.
Starboard motors	.....	.....	2,000	1,700	.....	28
Port motors	.....	.....	2,000	1,700	.....	27½

Third test (repeated).—Boat was allowed to gather full headway before the telegraphs were put to "full speed astern."

	Current at starting.		Maximum current.		Running current.	Time from telegraph order to motors going astern at 1,450 amperes.
	No. 1.	No. 2.	No. 1.	No. 2.		
						Secs.
Starboard motors	1,700	.....	2,000	.....	.....	58
Port motors	.....	.....	2,000	.....	.....	30

Time to stop the ship's way from telegraph order (speed about 10 knots) was one minute.

Fourth test.—Time taken to change from "full speed ahead" on the motors to "ahead" on the engines. (Time taken from telegraph order to moment of cylinders firing): Starboard, 21 seconds; port, 17 seconds.

"U–135"—Starting and Reversing Trials of Main Engines, 12 January, 1920, at Sea

[Times taken from telegraph order—in seconds.]

Maneuver.		Port.		Starboard.		Ship's way stopped.
From—	To—	Engines firing.	Required revolutions.	Engines firing.	Required revolutions.	
Stop	Full astern	15	24	11	20	.....
Full astern	Stop	.....	6	.....	4	.....
Stop	½ ahead	14	22	10	14	.....
½ ahead	Full astern	17	25	17	23	39
Full astern	½ ahead	22	24	20	32	45
½ ahead	½ astern	17	22	17	21	40
½ astern	¾ ahead	17	30	14	24	28
¾ ahead	¾ astern	17	19	18½	25	40
¾ astern	Full astern	.....	25	.....	20	.....
Full astern	Stop	.....	5	.....	6	.....
Stop	Full ahead	10	20	10	20	.....
Full ahead	Full astern	13	17	20	31	45
Full astern	Full ahead	16	19	17	33	42
Full ahead	Stop	.....	5	.....	4	.....

The quantity of air used for starting engines in the above trial was measured by the consumption from a group containing 35.3 cubic feet in reducing it from 120 to 50 atmospheres.

Total number of starts, 10 on each engine.

The revolutions corresponding to telegraph orders are as follows:

Slow speed, 150 revolutions.
Half speed, 200 revolutions.
Three-quarter speed, 300 revolutions.
Full speed, as fast as possible (about 320 revolutions).

From observations of the above table, the trial results may be deduced in round numbers as follows:

Time from telegraph order to engine firing in reverse direction, 17 secs.
Time from telegraph order to required revolutions in reverse direction, 23 secs.
Time from telegraph order to ship's way stopped on reversing, 40 secs.

"U–135"—Starting and Reversing Trials.

Notes by Engineer Commander LIMPENNY, D. S. O.

The reversing gear fitted to *U–135* is the usual type of M. A. N. reversing gear. There is a double set of cams, one for ahead and the other for astern, fitted on one shaft which can be moved to and fro in its bearings along the engine.

The valve rocking levers are carried on a shaft which can be rotated in its bearings, the fulcrums of the levers being eccentric to the shaft. This rocking shaft is first rotated half a turn to lift the valve rocking levers off the set of cams in use; the cam shaft is then moved along its bearings to bring the second set of cams in action and in line with the rocking levers. The rocking shaft is then given another half turn, which drops the valve rocking levers on to the cams.

This gear worked very satisfactorily. There were no false starts due to misfiring. The engine-starting levers have first to be put to "stop," i. e., "central," before the reversing gear, which is hydropneumatically worked, can be brought into action. Immediately the correct set of cams was placed for the rocking levers by the reversing gear; both starting levers could then be moved to put starting air on the six cylinders of the engine. Directly the engine made a couple of turns, one lever was moved to give fuel to three of the cylinders, and was followed immediately by the other lever to give fuel to the remaining three cylinders.

The greatest portion of the time taken to reverse is that occupied by the reversing gear changing the cams. A series of short puffs were observed in the exhaust immediately the engine started after reversing, but this soon cleared away. No tendency to bump or vibrate was observed in the engine or engine bed on going from "full ahead" to "full astern." The action was quite smooth.

"U–135"—Changing From Main Engines to Main Motors.

Engines going ahead at three-quarter speed (300 revolutions).

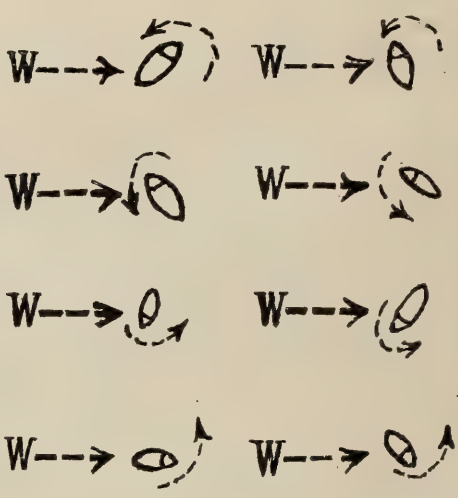
Times taken from telegraph order "stop engines" to motor under way:

	Sec.
First trial:	
Port side	17
Starboard side	17
Second trial:	
Port side	11
Starboard side	12

"U–135"—Turning Trials, 8 January, 1920.

A complete swing through 360° under full starboard helm (30½°). Speed, 150 revolutions, 5.78 knots, starting with wind and sea astern.

Angle turned through from original course as 0°.	Time intervals.		Mean position of ship relative to wind and sea.
	m. *s.*	*m.* *s.*	
0– 90	1 45		
40–130		1 41	
90–180	2 3½		
130–220		2 4	
180–270	2 1½		
220–310		2 30	
270–360	2 47		
310–400		2 3	
Total 360	8 37		
360		8 18	
First half circle.	*Per degree.*		
0–180	1. 27		
40–220		1. 25	
Second half circle.			
180–360	1. 60		
220–400		1. 52	



"U 135"—Turning Trials (continued), 9 January, 1920.

A comple swing through 360° under full port helm (30½°). Speed 200 revolutions, 8.75 knots, starting with wind and sea astern.

Angle turned through from original course as 0°.	Time intervals.			
	m.	*s.*	*m.*	*s.*
0– 90	1	18		
20–110			1	9
90–180	1	16		
110–200			1	16
180–270	1	15		
200–290			1	16
270–360	1	14½		
290–380			1	14
Total 360	5	3½		
360			4	55
First half circle.	*Per degree.*			
0–180	0.85			
20–200			0.81	
Second half circle.				
180–360	0.83			
200–380			0.83	

"U–135"—Turning Trials (continued), 13 January, 1920.

A complete swing through 360° under full starboard helm (30½°). Speed, 300 revolutions, 12.59 knots, starting with wind and sea astern.

Angle turned through from original course as 0°.	Time intervals.			
	m.	*s.*	*m.*	*s.*
0– 90	0	59		
20–110			0	52
90–180		54		
110–200				51
180–270		52		
200–290				54
270–360		55		
290–380				56
Total 360	3	40		
360			3	33
First half circle.	*Per degree.*			
0–180	0.63			
20–200			0.57	
Second half circle.				
180–360	0.60			
200–380			0.61	

"U–135"—Turning Trials (continued). 13 January, 1920.

A complete swing through 360° as for previous turn, but with only 15° of starboard helm, starting with wind and sea on the port bow.

Angle turned through from original course as 0°.	Time intervals.	
	m. s.	m. s.
0– 90	1 24	
20–110		1 18
90–180	1 25	
110–200		1 27
180–270	1 29	
200–290		1 28
270–360	1 19	
290–380		1 14
Total 360	5 37	
360		5 30
First half circle.	*Per degree.*	
0–180	0. 94	
20–200		0. 92
Second half circle.		
180–360	0. 93	
200–380		0. 90

"U–135"—Turning Trials (Continued). 14 January, 1920.

First turn.—Both engines at 370 revolutions, 16 knots. 15° starboard helm.

	m.	s.		s.
Time to turn through 90°	0	55	or	0.61 per degree.
Time to turn from 90–180°	1	3	or	0.70 per degree.
Total	1	58	or	0.655 per degree.

Second turn.—Conditions as above, but 15° port helm.

	m.	s.		s.
Time to turn through 90°	1	1½	or	0.68 per degree.
Time to turn from 90–180°	1	4½	or	0.72 per degree.
Total	2	6	or	0.70 per degree.

Third turn.—Conditions as for first turn.

	m.	s.		s.
Time to turn through 90°	1	0	or	0.67 per degree.
Time to turn from 90–180°	1	6	or	0.73 per degree.
Total	2	6	or	0.70 per degree.

Fourth turn.—A complete swing through 360° under full starboard helm (30½°), speed, 370 revolutions, 16 knots.

Angle turned through from original course as 0°.	Time intervals.	
	m. *s.*	*m.* *s.*
0– 90	0 52	
20–110		0 43
90–180	45	
110–200		45
180–270	45	
200–290		46
270–360	48	
290–380		48
Total 360	3 10	
360		3 3
First half circle.	*Per degree.*	
0–180	0. 54	
20–200		0. 49
Second half circle.		
180–360	0. 52	
200–380		0. 52

"U–135"—Summary of Turning Trials.

	Speed.	Rate of turning per degree.	Tactical diameter.
SUBMERGED.			
Full helm:	*Knots.*	*Seconds.*	*Yards.*
Motors in parallel, full fields	5. 5	1. 1	[1] 350
Motors in parallel, outer screw at full speed	[2] 6. 25	1. 02	.....
Motors in parallel, full speed	7. 06	. 97	[1] 400
Mean	.....	.....	375
SURFACE.			
Full helm	5. 78	1. 3	[1] 480
Do	8. 75	. 85	[1] 426 [3] 327
Do	12. 59	. 56	[1] 435 [3] 320
Do	16. 07	. 51	[1] 475 [3] 355
15° helm	12. 59	. 92	[1] 675 [3] 617
Do	16. 07	. 70	[3] 606
Mean	.....	.....	620

[1] Calculated from distance run assuming the ship's path to be a true circle, and reduction in speed 10 per cent due to turn.
[2] Estimated.
[3] Observed by sextant angle of height of hill on shore (not considered very reliable).

"U–135"—Summary of Measured Mile Records.

	Revolutions per minute.	Speed.
SUBMERGED.		
		Knots
Motors in parallel, full fields	197	5. 5
Motors in parallel, full speed	249	7. 06
SURFACE.		
Slow speed	150	5. 78
Half speed	201. 7	8. 75
Three-quarter speed	300. 8	12. 59
Full speed	369. 4	16. 07
Utmost speed	381. 4	16. 7

"U–135"—Four Hours Trial at Slow Speed (150 r. p. m.), 8 January, 1920.

Measured mile results.

Polperro mile: 6,990 feet.
Wind: Force 4–5, ahead when going west.
Sea: 3–4, slight.
Draft of water: 14 feet forward and aft (approx. M. B. trim).
Displacement: 1,160 tons.
Last docked July, 1919; bottom now fairly clean.
Composition:

No. of run.	G. M. T.	Course.	Time.	Speed.	R. P. M.		I. H. P.	
					Port.	Starboard.	Port.	Starboard.
			m. *s.*	*Knots.*				
I	Noon.	266	12 $46\frac{1}{5}$	5. 40	151	146	.....	.....
II	12. 37	86	10 $57\frac{1}{5}$	6. 30	153	153	.....	.....
III	1. 10	266	12 $52\frac{2}{5}$	5. 36	148	150	.....	.....
IV	1. 46	86	11 $5\frac{3}{5}$	5. 87	148	152	.....	.....
			Means....	5. 78	150	150	635	

Speed for the four hours deduced from the above data: 5.78 knots.
Distance run per ton of fuel: 66.1 nautical miles.
Consumption of fuel in pounds per I. H. P. per hour: 0.308.
Propellers: Two in number, bronze, three-bladed, outward turning. Pitch: ———.
Diameter: ———. Expanded blade area per propeller: ———.
Immersion of upper edge: 4 feet 6 inches.

Four hours' trial.

[Pressures in kg. per sq. cm. Temperatures in centigrade.]

	First hour.	Second hour.	Third hour.	Fourth hour.	Mean.
Engine revolutions per minute:					
Port	151.3	150	152	152	151.32
Starboard	146.5	145.5	151.8	148.3	150.27
Average	148.9	152.2	151.9	150	150.79
Slip of clutch: Nil.					
Compressor:					
First stage—					
Port	4.4	4.3	4.3	4.3	4.325
Starboard	4.4	4.2	4.2	4.2	4.25
Second stage—					
Port	19	19	19	19	19.00
Starboard	20	19	20	19.5	19.60
Third stage—					
Port	64	64	65	65	64.50
Starboard	73	72	74	71	73.50
Blast pressure:					
Port	62	62	62	62	62.00
Starboard	73	72	72	70	71.75
Pressure of circulating water:					
Port	1.7	1.7	1.7	1.7	1.70
Starboard	1.7	1.7	1.7	1.7	1.70
Maximum temperature of circulating water (outlet from engine):					
Port	15	15	15	15	15.00
Starboard	16	16	16	16	16.00
Temperature of circulating water (out from exhaust pipe):					
Port	15	15	15	15	15.00
Starboard (not taken).					
Temperature of sea water: 8.3					
Circulating pump:					
Voltage, port	265	265	265	265	265.00
Amperes, port	35	28	25	26	28.50
Forced lubrication oil:					
Pressure before filter—					
Port	4	4	4	4	4.00
Starboard	4.5	4.5	4.5	4.5	4.50
Pressure after filter—					
Port	4	4	4	4	4.00
Starboard	4.5	4.5	4.5	4.5	4.50
Piston cooling pressure:					
Port	4	4	4	4	4.00
Starboard	4.5	4.5	4.5	4.5	4.50
Piston cooling oil temperature:					
Before entering cooler (i. e., after leaving piston)—					
Port	20	18	19	19	19.00
Starboard	20	18	19	19	19.00
Before entering pistons (i. e., before entering pistons)—					
Port	16	16	16	16	16.00
Starboard	16	16	16	16	16.00
Bearing oil pressure:					
Port	1.5	1.6	1.6	1.6	1.575
Starboard	1.5	1.5	1.5	1.5	1.50
Temperature of oil entering bearings:					
Port	16	16	16	16	16.00
Starboard	16	16	16	16	16.00

Four hours' trial—Continued.

	First hour.	Second hour.	Third hour.	Fourth hour.	Mean.
Temperature of oil leaving bearings (port and starboard): Cannot be taken.					
Amount of lubricating oil expended: Negligible.					
Forced lubrication pumps:					
Voltage, starboard	265	265	265	265	265.00
Amperes	47(?)	56	56	57	56.50
Fuel expended (4 hours): 400 liters.					
Quality of fuel: American distillate.					
Specific gravity of fuel: 0.89.					
Average mean indicated pressure (pounds per square inch):					
Port	38.5	.....	.....	39.8	39.15
Starboard	38.3	.....	.....	39.4	38.85
I. H. P.:					
Port	315	.....	.....	324	319.50
Starboard	312	.....	.....	320	316.00
Total, port and starboard	627	.....	.....	644	635.50
Maximum explosion pressure (pounds per square inch):					
No. 5, port	571	.....	.....	.....	.....
No. 3, starboard	.....	.....	.....	648	.....
Mean (pounds per square inch)	524	.....	.....	528	526.00
Fuel consumption (pounds per I. H. P.): 0.308.					
Fuel consumption (pounds per B. H. P.), assuming efficiency of 0.6 at this power: 0.51.					

"U–135"—Four Hours' Trial at 200 R. P. M., 9 January, 1920.

[Pressure in kg./cm. Temperatures C.]

	First hour.	Second hour.	Third hour.	Fourth hour.	Mean.
Engine revolution:					
Port	193	202	198.5	201	198.60
Starboard	203	206	205	203.3	204.30
Average	.....	.....	.....	.....	201.45
Slip of clutch (if any): Nil.					
Compressor:					
First stage—					
Port	3.8	4.0	3.8	3.9	3.87
Starboard	4.2	4.2	4.1	4.2	4.17
Second stage—					
Port	20	18	19	18	18.75
Starboard	20	20	19	19	19.50
Third stage—					
Port	76	78	77	76	76.75
Starboard	75	80	76	79	77.50
Blast pressure:					
Port	66	74	70	72	70.50
Starboard	73	77	74	76	75.00
Pressure of circulating water:					
Port	1.6	1.6	1.6	1.6	1.60
Starboard	1.5	1.5	1.5	1.5	1.50
Maximum temperature of circulating water (outlet from engine):					
Port	17	17	17	16	16.75
Starboard	20	19	19	19	19.25

"U–135"—Four Hours' Trial at 200 R. P. M., 9 January, 1920—Continued.

	First hour.	Second hour.	Third hour.	Fourth hour.	Mean.
Temperature of circulating water (outlet from exhaust):					
Port	18	18	18	17	17.75
Starboard (not taken).					
Temperature of sea water	48	48	48	48	48.00
Circulating pump:					
Voltage	250	250	250	250	250.00
Amperes—					
Port	15	14	15	14	14.50
Starboard	35	35	35	34	34.75
Forced lubricating oil:					
Pressure before filter—					
Port	4	4	4	4	4.00
Starboard	4.25	4.3	4.25	4.2	4.25
Pressure after filter—					
Port	4	4	4	4	4.00
Starboard	4.25	4.3	4.25	4.2	4.25
Piston cooling pressure:					
Port	4	4	4	4	4
Starboard	4.5	4.25	4.2	4.2	4.29
Piston cooling oil:					
Temperature before cooling—					
Port	24	24	24	23	23.75
Starboard	24	24	24	24	24.00
Temperature entering pistons—					
Port	18	18	19	18	18.75
Starboard	17	17	17	17	17.00
Bearing oil pressure:					
Port	1.5	1.5	1.5	1.5	1.50
Starboard	1.5	1.5	1.5	1.5	1.50
Temperature of oil entering bearings:					
Port	18	18	19	18	18.25
Starboard	17	17	17	17	17.00
Lubricating oil expended: 35 gallons.					
Forced lubrication, pumps:					
Voltage, starboard	250	250	250	250	250.00
Amperes	52	53	53	53	52.75
Fuel expended, 4 hours: 585 litres.					
Quality of fuel: American distillate.					
Specific gravity of fuel: 0.89.					
Average mean indicated pressure (pounds per square inch):					
Port	52.9	57.7	.....	.....	55.30
Starboard	54.3	56.8	.....	.....	55.55
Average I. H. P.:					
Port	568	630	.....	.....	599.00
Starboard	594	619	.....	.....	606.50
Average I. H. P. (starbaord and port)	1,162	1,249	.....	.....	1,205.50
Maximum explosion pressure (pounds per square inch):					
No. 5, port	650	625	.....	.....	637.50
Mean explosion pressure (pounds per square inch)	568	555	.....	.....	561.50

Fuel consumption (pounds per I. H. P., per hour): 238.

Fuel consumption (pounds per B. H. P. per hour), assuming brake efficiency of 0.6 at this power: 0.4.

Measured mile results at 200 R. P. M.

Wind: Force 3–4, ahead going west.
Sea: 1–2.
Other conditions: As for measured mile at slow speed.

No. of run.	G. M. T.	Course.	Time.	Speed.	R. P. M.		I. H. P.	
					Port.	Starboard.	Port.	Starboard.
	a. m.		*m. s.*	*Knots.*				
I	11. 32	86	7 48	8. 85	207	200	.....	.....
II	11. 57	266	7 57 1/5	(8. 79)	203	193	.....	.....
	p. m.							
III	12. 23	86	7 58 1/5	8. 66	201	201	.....	.....
IV	12. 48	266	7 46 4/5	8. 86	202	202	.....	.....
V	1. 17	86	8 3 2/5	8. 56	200	208	.....	.....
Means	First four			8. 76	202	200	1, 205. 50	
	Last four			8. 74				
					201			

Speed for 4 hours deduced from above data: 8.76 knots.
Distance run per ton of fuel, 68.5 nautical miles.
Consumption of fuel (pounds per I. H. P. per hour), 9.238.
Propellers: As already stated (see slow speed measured mile results).

"U-135"—Four Hours' Trial at Three-quarter Speed (300 revolutions), 13 January, 1920.

Measured mile records.

Run.	Course.	Time.	Speed.	Revolutions.		Remarks.
				Port.	Starboard.	
		m. s.				
I	West...	6 0. 2	11. 49	.....	.....	Wind: Force 3. On port bow going wset, on starboard quarter going east. Sea: 2. Slight swell from southward.
II	West...	5 16. 8	13. 49	.....	.....	
III	West...	5 51. 6	11. 76	.....	.....	
IV	East.....	5 7. 6	13. 46	.....	.....	
	Means.	.....	12. 59	300	301. 6	

I. H. P.: 3,050.
Distance run per ton of fuel: 37.6 nautical miles.
Consumption of fuel (pounds per I. H. P. per hour): 0.246.

Engine records.

[Pressures in kg. per sq. cm. Temperatures in centigrades.]

	First hour.	Second hour.	Third hour.	Fourth hour.	Mean.
Revolutions per minute:					
Port	301	300	301	300	300. 5
Starboard	301	301. 6	301	301	301. 2
Average	.....	.....	.....	.....	300. 85

Slip of clutch: Nil.

Engine records—Continued.

	First hour.	Second hour.	Third hour.	Fourth hour.	Mean.
Air compressor pressures:					
First stage—					
Port	4.5	4.5	4.5	4.5	4.5
Starboard	4.15	4.15	4.15	4.15	4.15
Second stage—					
Port	19	19	19	19	19
Starboard	20	20	20	20	20
Third stage—					
Port	76	73	73	77	74.75
Starboard	75	72	76	78	75.25
Blast pressure:					
Port	72	68	72	74	71.5
Starboard	73	70	70	73	71.5
Circulating water pressure:					
Port	2	1.7	1.7	1.7	1.775
Starboard	1.7	1.8	1.8	1.8	1.775
Temperature of circulating water leaving cylinders:					
Port	25	25	26	26	25.5
Starboard	24	25	25	25	24.75
Temperature of circulating water leaving exhaust pipe:					
Port	25	25	26	26	25.5
Starboard (thermometer broken).					
Lubricating oil pressure:					
Port	1.5	1.5	1.5	1.5	1.5
Starboard	1.5	1.5	1.4	1.4	1.45
Piston cooling pressure:					
Port	4.2	4.2	4.2	4.2	4.2
Starboard	4.5	4.5	4.5	4.5	4.5
Temperature of oil leaving pistons:					
Port	34	34	34	34	34
Starboard	34	34	34	34	34
Temperature of oil leaving coolers:					
Port	22	22	23	23	22.5
Starboard	20	20	21	21	20.5
Temperature of thrust blocks:					
Port	34	35	36.5	36.5	35.5
Starboard (thermometer broken).					
Temperature of oil settling tanks. NOTE.—This is a mixture of oil leaving bearings and pistons. Lubricating oil consumed in 4 hours: 55 liters. Fuel consumed in 4 hours: 1,530 liters.	27	30	31	32	30
Circulating pump motor:					
Amperes—					
Port	28	34	35	35	33
Starboard	22	15	15	16	17
Volts—					
Port	250	250	250	250	250
Starboard	250	250	250	250	250
Lubricating-oil pump motor:					
Amperes, starboard	48	49	49	50	49
Volts	250	250	250	250	250

Engine records—Continued.

	First set of cards.	Second set of cards.	Mean.
Mean indicated H. P	3,040	3,050	3,045.5
Mean explosion pressure (pounds per square inch)	550	556	553
Maximum explosion pressure (pounds per square inch):			
No. 5, port	648		
No. 2, port		625	
Fuel consumption (pounds per I. H. P. per hour)			.248

"U–135"—Four hours' trial at full power, 14 January, 1920.

Measured mile records.

Run.	Course.	Time.	Speed.	Revolutions.		Remarks.
				Port.	Starboard.	
		m. *s.*				
I	West	4 20.4	15.89			Wind: 1. Sea: 1–2. Slight swell.
II	East	4 13.2	16.35			
III	West	4 23	15.74			
IV	East	4 14.8	16.38			
	Means		16.07	373.3	365.5	
				369.4		

I. H. P.: 5,170.
Distance run per ton of fuel: 24.13 nautical miles.
Consumption of fuel (pounds per I. H. P. per hour): 0.242.

Engine records.

[Pressures in kg. per sq. cm. Temperatures in centigrade.]

	First hour.	Second hour.	Third hour.	Fourth hour.	Mean.
Revolutions per minute:					
Port	365	373.3	374.9	373.1	371.59
Starboard	362	365.5	365.7	364.1	364.3
Average					367.5
Slip of clutch: Nil.					
Air compressor pressures:					
First stage—					
Port	4.5	4.5	4.5	4.5	4.5
Starboard	4.2	4.2	4.2	4.4	4.25
Second stage:					
Port	20	20	20	20	20
Starboard	19	19	19	19	19
Third stage:					
Port	82	85	85	85	84.75
Starboard	82	84	82	82	82.5

Engine records—Continued.

	First hour.	Second hour.	Third hour.	Fourth hour.	Mean.
Blast pressure:					
Port	78	78	80	80	79
Starboard	80	81	80	80	80.25
Circulating water pressure:					
Port	1.7	1.7	1.7	1.7	1.7
Starboard	1.7	1.7	1.7	1.7	1.7
Temperature of circulating water leaving cylinders:					
Port	45	47	47	47	46.5
Starboard	38	39	39	40	39
Water leaving exhaust pipe:					
Port	45	47	47	47	46.5
Starboard	38	39	39	40	39
Lubricating oil pressure:					
Port	4	4	4	4	4
Starboard	4.1	4.1	4.1	4.1	4.1
Piston-cooling oil pressure:					
Port	4	4	4	4	4
Starboard	4.4	4.4	4.4	4.4	4.4
Temperature of oil leaving pistons:					
Port	47	46	47	47	47
Starboard	46	46	46	46	46
Temperature of oil leaving coolers:					
Port	30	32	32	32	31.5
Starboard	26	26	26	26	26
Lubricating oil pressure to bearings:					
Port	1.5	1.5	1.5	1.5	1.5
Starboard	1.6	1.6	1.6	1.6	1.6
Temperature of thrust blocks:					
Port	35	36	37	37	36.25
Starboard (thermometer broken).					
Temperature of oil in settling tanks	42	42	43	44	42.75
Lubricating oil consumed in 4 hours, 70 liters.					
Fuel consumed in 4 hours, 3.035 liters.					
Circulating pump motor:					
Amperes—					
Port	34	36	37	37	36
Starboard	14	14	14	14	14
Voltage, port	265	265	265	265	265
Oil, starboard	265	265	265	265	265
Lubricating pump motor:					
Amperes—					
Port (not in use).					
Starboard	44	43	42	42	42.75
Voltage, starboard	265	265	265	265	265
I. H. P.:					
Port	.....	2,760	.....	2,830	.....
Starboard	.....	2,410	.....	2,360	.....
Total, port and starboard	.....	5,170	.....	5,190	5,180

Mean explosion pressure (pounds per square inch), 582.
Maximum explosion pressure (pounds per square inch, No. 2, port), 690.
Fuel consumption (pounds per I. H. P. per hour), 0.248.

"U-135"—Measured Mark Records at Utmost Power, 14 January, 1920.

Measured marks observed during run at utmost power. Course 95°. Revelstoke Point right ahead. Observations by transits.

	Course.	Distance.	Time.	Speed.	Revs.
		Miles.	*M. s.*	*Knots.*	
First observations, between Rame Head and Breakwater Light....	East...	1.5	5 19½	16.93	381.4
Second observation, between Fort and Mewstone.....	East...	1.25	4 4	18.08	381.4
	West...	1.25	4 12½	17.85	381.4

Strength of tide, 23 knots.

The transits for the first observation were parallel and quite reliable and the result of this observation may be taken as correct.

For the second observation, however, the transits were not parallel, and it is therefore uncertain what exact distance was run in between them. It may be assumed, however, that the distance was the same for east and west runs, as the ship was carefully put back on her track after turning. The difference between the two speeds may therefore be taken as twice the strength of the tide, and if half this be applied to the first observation it should give a fair deduction for the speed.

Owing to the blowing of a cylinder relief valve, the westerly run over the first observed marks had to be abandoned.

Speed obtained on eastward run	knots..	16.93
Less strength of tide against	do....	.11
Deduced speed	do....	16.82
Average revolutions:		
Port		382.7
Starboard		380
Mean		381.4
I. H. P.		5,590
Speed calculated from above revolutions on the results of previous measured mile records	knots..	16.6

"U–135"—Utmost Speed Trial (continued).

Engine records (one-half hour only).

[Pressure in kg. per sq. cm. Temperatures in centigrade unless otherwise stated.]

	Port.	Starboard.
Revolutions per minute	382.7	380
Average, 381.3.		
Slip of clutch, nil.		
Air compressor pressures:		
First stage	4.5	4.2
Second stage	20	19
Third stage	88	82
Blast pressure	82	72
Circulating water pressure	1.7	1.7
Temperature of circulating water:		
Leaving cylinders	44	40
Leaving exhaust pipe	44	40
Oil pressure main	4	4.2
Lubricating oil pressure to bearings	1.7	1.8
Piston cooling oil pressure	4	4.2
Temperature of oil leaving pistons	48	47
Temperature of oil leaving coolers	33	27
Temperature of thrust blocks	38	[1]
I. H. P.	3,080	2,510

[1] Thermometer broken.

Mean I. H. P.	5,590
Mean explosion pressure (pounds per square inch)	600
Maximum explosion pressure (pounds per square inch, No. 2, port)	700
Mean indicated effective pressure (pounds per square inch):	
Port	148.5
Starboard	121.8

"U–135"—Notes on Running of Engines.

Lubrication Arrangements.

The oil for lubrication of bearings and for piston cooling purposes is supplied by two pumps, one being worked off each main engine and also by two separately driven motor pumps. The main engine pumps, owing to defects, were disconnected, and the oil during these trials was supplied by the independently driven port motor pump, all the four pumps taking their suction from a manifold which has connections to the forward and after ready-use tanks. The oil is then discharged from the pumps to another manifold with separate connections to port and starboard coolers. The discharge of all four pumps go to the manifold, and the whole system can be cross connected at will. The oil leaves the coolers by two discharges, one direct to the pistons for cooling purposes and one through a pressure-regulating valve to the main lubrication system. After its passages from pistons and bearings the oil returns to the ready-use tanks.

The oil supplied by the one port motor pump was found to be sufficient for the purpose. As a matter of fact, one pump has up to the date of these trials been found sufficient for 300 revolutions. There is therefore a large reserve of supply.

Thermometers are fixed to show the temperature of the oil leaving the coolers and also of the oil leaving each piston.

All the bearings of engines and main motors are force lubricated, the only exception being one plumber block on each engine just before the stern gland.

A great advantage over the British submarine Diesel lies in the lubrication of the cam-shaft bearings and rollers, which are all force lubricated, as also are the valve-actuating rockers. There was no heat observable on any of the bearings nor in the gearing of the vertical shaft which drives the cam shaft from the main engine crank shaft and in which some heat might reasonably have been expected. Each valve-actuating lever has a spring in tension attached, always tending to keep the roller on to the cam, and thus knocking and noise are avoided.

The various working parts which were visible to the eye, such as valve lever rollers, valve lever bearings, etc., show no sign of wear. The motor bearings run at about the same temperature as the British; i. e., a warmth of about 90° F. was to be observed.

Cooling Arrangements.

The cooling water is supplied, as in the case of the oil, by four pumps, one driven off each main engine at forward end and two motor-driven pumps. The motor-driven pumps were used in the trials.

The water is discharged through the port and starboard oil coolers thence to the cylinders, cylinder heads exhaust valves, main exhaust pipe muffler, and thence to the compensating tank on the upper deck. The cylinder heads kept quite cold to the hand, which is very different to the British submarine Diesel. No heat was observable anywhere either in cylinders or exhaust pipes except at the very upper end of the cylinder just at the flange on which the cylinder head is fixed.

Thermometers are fixed at the water pipes which lead from each cylinder. These are of very great use, as the temperature of the cooling water passing from each unit can be instantly observed.

A thermometer is also fixed to show the temperature of the cooling water before it finally leaves the engine on its passage to the compensating tank.

Vibration.

There was no vibration observable. The engines appeared to be fixed very firmly and are very rigid. Not the slightest movement was noticed in the cylinder heads; this appears to show that this engine approximated very nearly to the slow-burning fuel constant pressure type. This fact probably helps to explain the lack of vibration.

The absence of push rods helps to make the engines very noiseless. This was very noticeable.

Critical Speeds.

These are plainly marked on the revolution indicators, and the effect of passing through these speeds was immediately evident, a noise like the rumble of distant thunder being heard.

Indicating Gear.

Very simply arranged, a piston in a guide being worked off the walking pipes of the cooling oil to each piston. A rod passing through the casing of the engine off the walking pipe actuating this piston. A string is then attached from the piston to the indicator.

Valve Gear.

All the springs for exhaust, induction, and Diesel valves are compression springs and totally inclosed. The result is that if a spring breaks the valve will still be actuated. This has actually occurred on passage. By means of a hook fitted on the hull and an eye in the valve spindle a tension spring can be fitted under way if the valve spring has been badly damaged without stopping the engine.

The cams have a slow and very gradual gradient to the cam proper, thus preventing any sudden blow or fling off.

Clutch Gear.

Lohmann clutches, hydropneumatically worked, are fitted. Action practically instantaneous—a great advantage over the British Star clutch, which has to be in a certain position before it can be engaged.

The clutch also appears to be very light. It is quite easily adjusted. A maximum of 10 mm. should be sufficient to adjust one of these clutches at sea.

Reversing Gear.

This worked very efficiently. The main engines are used for maneuvering in coming alongside the depot ship. Great saving in battery power is therefore obtained.

The time required to go from "ahead" to "stop" as "astern" is quite as little as that obtained in using the motors. (See starting and reversing trials).

Thrust Blocks.

Thrust blocks are fitted just abaft the motors. Form of construction not ascertained, but undoubtedly of bigger size than that which would be required for Michel thrusts for the same power.

Tail clutches are not fitted.

Safety Arrangements.

Interlocking gear and safety gear is fitted for the following purposes:

(*a*) To prevent starting levers being put to air on engines when in mid position between "ahead" and "astern."

(*b*) To prevent engines being put from "ahead" to "astern" or vice versa without stopping, i. e., without shutting off fuel.

These worked efficiently and were quite satisfactory.

Evaporator and Distilling Plant.

At the end of the exhaust pipe on each engine, before it leaves the engine room, there is fitted a generator. The port generator is out of action. The construction is as follows:

The exhaust gas is passed through a series of straight tubes surrounded by a casing. Into this casing the hot circulating water is discharged as it leaves the engine through a feed valve.

The water strikes the hot tubes and is formed into steam. The steam from both generators is passed into one separator, where any salt spray carried over is deposited. From thence it is lead into a valve box and passed through the heating system and radiators in the ship. It can also be passed into a distiller, where it is cooled in the usual manner by cold salt water tapped off the inlet end of the circulating water for main engines.

The water formed is passed through an electrical detector for salt, and if brackish can be passed either to the bilge or to washing water tanks. If pure, it is passed to a tank set apart for topping up water for the batteries.

A motor-driven brine pump takes brine away from the generators and discharges it into the overboard pipe of circulating water for main engines.

At 250 revolutions practically no steam was generated, and it would appear that the exhaust gases do not contain enough heat at this power.

Cleanliness of the Engine Room.

The engine keeps remarkably clean. This, in the first place, is due to the fact that all the lubrication is forced and practically inclosed. There is an entire absence of hand lubrication, with its attendant wastefulness and oil drips. The crank pit is also free from dirt, and there is absolutely no comparison as regards cleanliness between the crank pit of this engine and that of a British submarine engine when opened out after a run.

On examination after a run there were no signs of carbon or black oil. The lubricating oil was just as clear as if it had been drawn at that moment from a fresh store. The cylinders, pistons, connecting rods, etc., were as bright as when they left the shop. The tool marks on the cylinder liners were still in evidence. No fumes were observ-

able, and it would appear there was very little splash experienced from the connecting rods.

Another noticeable feature is the absence of water leaks. Owing to the smooth running of the engine there is no movement between the cylinder cover and the cylinder, and consequently no leakage or dribbles of water running down the cylinder jacket and into the crank pit. Owing, also, to the formation of the crank pit nothing in the way of outside dirt, water, etc., can find its way into the crank pit, as is possible through the tie plates of the British submarine engine.

The formation of the skirt of the cylinder being combined with the engine crank pit, assists to make the whole unit extremely rigid.

"U-135"—Supplementary Notes on Full Power Trial and Half-Hour Overload.

General remarks as for those of lower powers.

The following remarks are additional and applicable only to the full power and overload trials.

Vertical Drive to Cam Shaft.

The bevel wheel gearing at top end of starboard engine began to warm up slightly, but this was arrested by increasing the oil pressure to this engine.

The port engine was warmer generally than the starboard, and was developing higher power. To explain this it should be noted that the port engine had been retimed before the trials, whereas the starboard had not.

All other parts of the engine were cold.

Cranks.

The cranks and main bearings were felt and were just hand warm, and were very much colder than the cranks and main bearings of the British submarine Diesel would have been at full power.

Vibration.

Vibration was practically nil, as also was the vibration in the hull when standing directly over the propellers.

No movement in engine bed.

Motor Bearings.

The motor bearings, which are not force lubricated, were rather warm, the port being about 140° F. at the end of the trial. The rise in temperature was, however, greatly arrested by the cooling air to motor room being put in action.

Half-Hour Overload.

The relief valve on No. 2 cylinder starboard was constantly lifting, probably due to a weak spring. A reduction in blast air pressure stopped this, but prevented the engine developing its full power.

For the first quarter of an hour of the overload before this relief valve lifted the starboard engine was doing 390 revolutions and the port 400. Owing, however, to having to avoid the fishing fleet,

the helm was in use a great deal, which had a tendency to slow up the average revolutions for the half hour generally.

The motors were not harnessed in its addition, as it was thought that the extra H. P. added might be dangerous for the shafts until further information can be obtained as to the strength of these shafts, as they were developing well over their B. H. P. (taken as 75 per cent of the I. H. P.) without adding in the motors. The overload run was stopped at the end of three-quarters of an hour owing to defective Diesel valve in No. 2 starboard cylinder.

Fuel Consumption.

Fuel consumptions appear low and may not be quite reliable owing to the rolling of the ship and the difficulty of measuring the gauge glasses on the gravity tanks.

Exhaust.

Slight black haze observable; more distinct on the overload.

A fairly large amount of steam about equivalent to that seen in a locomotive on starting was developed intermittently in the exhaust due to the sea water washing into the exhaust pipe, which was about 2 feet above the normal water line.

The attached tabular statement of "Engine trial records," and the curves drawn from it, gives the principal results of engine trials.

Curves on Revolution Base.

The curves for B. H. P. are based on the results of German records for the shop tests of a 550-H. P. M. A. N. engine.

The ratio B. H. P./I. H. P. is shown graphically.

Curves on Speed Base.

1. *Revolutions per minute.*—The plotted points do not lie in a straight line, but as the recorded revolutions by counter are not absolutely reliable owing to the fact that they only record to the nearest 10 revolutions, a straight line through the mean positions may be drawn to represent the relation between revolutions per minute and speed.

2. *Fuel consumption per day.*—To obtain the economical speed a consumption of 400 liters per day is allowed for auxiliary purposes, which is assumed on the results of practical experience. Drawing a tangent to the curve from the point so obtained gives the economical speed as $8\frac{1}{4}$ knots, or from $7\frac{1}{2}$ to 9 for practical purposes.

Smoke in Exhaust.

During the lower powers the exhaust was quite invisible, but at 300 revolutions a very slight coloring was observed when steaming head to wind due to the exhaust trailing a long way astern in a straight line. At full power and utmost power it was slightly more noticeable.

Apart from smoke, there was a great deal of steam developed every time a sea washed over the exhaust outlet on the side, and this

would have been very plainly visible for a long distance at sea. At full power in a slight swell a large cloud of steam was practically continuous on the weather side.

Vibration.

The only occasion when vibration was at all noticeable was on going from "full speed ahead" to "full speed astern," when owing to the stern lifting on the swell the propellers raced slightly.

At certain critical speeds a very slight vibration was noticeable on the bridge.

At all speeds the vibration in the after compartment was very slight, and it was possible to write legibly on the rear doors of torpedo tubes.

The Cooling Installation for Main Motors.

Was run throughout the full power and utmost power trials and was effective in keeping down the temperature of main motor bearings, which had warmed considerably the previous day during the three-quarter power trial.

"U-135"—Tabular Statement of Engine Trial Records.

Date.	Mean revolutions per minute.	Mean speed.	Fuel consumption for 4 hours.	Mean I. H. P.	Ratio $\frac{B.H.P.}{I.H.P.}$ (from German records of shop tests for 550-H. P. M. A. N. engine).
1920.		*Knots.*	*Liters.*		
8 Jan.	150	5. 78	400	635	0. 58
9 Jan.	201. 5	8. 77	585	1, 205. 5	. 635
13 Jan.	300. 8	12. 59	1, 530	3, 045	. 675
14 Jan.	368	16. 01	3, 035	5, 180	. 72
14 Jan.	381. 4	16. 6	.....	5, 590	.....

Mean B. H. P.	Fuel combustion.		Distance run per ton of fuel.	Radius of action (allowing 400 liters per day for auxiliary purposes: (*a*) With main O. F. tanks—65 tons. S./g. 0.89. (*b*) With reserve O. B. tanks in addition 208 tons. S/g. 0.89 (day).	
	Per I. H. P.	Per B.H.P.			
	Pounds.	*Pounds.*	*Naut.miles.*	*Naut.miles.*	*Naut.miles.*
368	0. 308	0. 53	66. 1	(*a*) $26\frac{1}{2}$	3, 680
				(*b*) 85	11, 800
765	. 252	. 397	68. 5	(*a*) 19	3, 990
				(*b*) 61	12, 800
2, 053	. 246	. 369	37. 6	(*a*) 7. 8	2, 347
				(*b*) 24. 9	7, 525
3, 732	. 242	. 336	24. 13	(*a*) 4. 0	1, 531
				(*b*) 12. 8	4, 895

MISCELLANEOUS.

TRADE CONDITIONS IN GERMANY.

16 August, 1920.

SOURCE: RELIABLE.

Conditions in the Russian Iron District.

According to a German iron-trade paper Metallborse, there are now in Soviet Russia 1,191 iron and steel plants, of which 640 are nationalized—or under Government control. In 1919, 40,000,000 poods of iron were delivered to the trade, which was about 30 per cent of the actual requirements. In January, 1920, the stock of iron and steel on hand in Soviet Russia, inclusive of the Ural District, was estimated at 25,000,000 poods; there was also 5,000,000 poods of other metals on hand, the total of which was far below the demands of the trade.

There are 94 furnaces in the Ural District, 14 of which are in operation and producing at the rate of 1,000,000 poods of pig iron annually. Of 95 Martin furnaces only 16 are at work, with a production of about 1,300,000 poods, or 25 per cent of the prewar output. Of 14 puddling furnaces, only 6 are in working order. The number of workmen employed in the Ural District is estimated at 100,000, or one-half of the prewar number. The above-mentioned furnaces are of small size and burn wood. It is estimated that the Russian iron production does not exceed 20 per cent of the prewar output.

The output of the locomotive plants during 1919 ranged from 40 to 50 per cent of that of 1913. The output of the passenger-car and truck plants fell to 10 per cent, that of the plants making spare parts to 30 per cent, and the output of the factories making agricultural machines was only 40 per cent of the prewar output. It is significant that in proportion as the manufacture of agricultural machines declined the manufacture of primitive tools like scythes has increased enormously.

Price of Steel Rails in Germany.

According to the German press, the export of German rails, which in prewar times was a very important one, has stopped entirely. Steel rails now cost 2,000 per cent more than in 1914—as against a rise in price in the United States of about 200 per cent.

Unsatisfactory Conditions in the German Iron Industry.

The German small-iron industry is meeting with serious difficulties. According to the European press, a committee of manufacturers of ironware will shortly visit Luxemburg, Belgium, and North America with the object of buying bar iron. Experts say that American iron imported into Germany will be cheaper than homemade iron, principally on account of the coal agreement at Spa, which will force various iron plants to reduce their output.

Sugar Production in May, 1920.

Germany's production of raw sugar in May, 1920, amounted to 2,567,190 pounds. During the period from September, 1919, to May 31, 1920, 1,557,068,700 pounds of raw sugar were produced, as against 2,914,075,700 pounds in the same period of the previous year. The production of refined sugar from September, 1919, to May 31, 1920, was 1,346,319,680 pounds, as against 2,786,579,620 in the same period of the preceding year.

The Fertilizer Market in Germany.

Although in normal times Germany at this season of the year exports tens of thousands of tons of potash salts to the United States, there is at present very little moving. Because of cheaper prices quoted to Holland, and possibly to other countries, American buyers have of late placed but few orders, and the result is a great accumulation of potash stocks at the mines.

The rumor that potash mines in Germany were to be nationalized seems to have subsided; and now most of the workmen have voluntarily abandoned the system of working for daily wages (which developed after the revolution), and at their request the various companies have begun to restore the prewar system of piecework.

The fertilizer market has also been able to supply German farmers with nitrate of soda, nitrate of lime, and sulphate of ammonia, and it is believed that by autumn Germany's agriculture will be amply supplied with fertilizer. Deliveries are being made now, as cars will be short in the autumn, when coal, beets, potatoes, etc., are being moved. To encourage these early deliveries and thus insure an adequate supply, agricultural societies are offering a subsidy of 80 marks toward the storage of each 10,000 kilograms of ammonia delivered by the potash combine during July and a sum of 40 marks for August deliveries. Superphosphate alone is scarce at present.

The prices per hundredweight are fixed according to the percentage of nitrogen present. Sulphate of ammonia is priced at 123 marks for 20.5 per cent; nitrate of soda, 120 marks for 16 per cent; ammonia sulphate of saltpeter, 169 marks for 26 per cent; and nitrate of lime, 96.30 marks for 18 per cent.

Low water in the Elbe is making summer deliveries of potash by barge to Hamburg slow and difficult.

Increased Bank Deposits in Berlin.

Notwithstanding the depreciation of the mark and the general uncertainty of conditions in Central Europe, the winter of 1919–20 was conspicuous for the singular activity of the investment world in Germany. Many fortunes were made and lost on the Berlin stock exchange, and the shares of many corporations were conspicuous by their wide range of price. This intensive speculation, the many increases of capital stock by various corporations, and the continual output of paper money all served to swell the business of the banks.

At the end of 1919 the deposits of the eight big banks amounted to 39,000,000,000 marks, an increase of 100 per cent in 12 months. Liabilities, inclusive of acceptances, amounted to 40,000,000,000 marks at the end of 1919, as against 6,400,000,000 marks in 1913. The business of the larger banks showed a higher rate of increase than that of the small banks. The business of the "Discontogesellschaft" increased 124 per cent, that of the Deutsche Bank 105 per cent, that of the Dresdener Bank 96 per cent, and that of the Darmstaedter Bank nearly 100 per cent. The lowest increase was attained by the "Nationalbank fuer Deutschland," with 50 per cent. In view of this growth of business many branches have been established.

The banks' cost of doing business has also increased enormously, and the banking world is constantly uneasy for fear of strikes among the many thousands of employees, who have organized and are constantly threatening to strike. Some of the banks have adopted a system of bonuses, with a view to avoiding strikes.

According to a recent press statement, the liabilities of the eight big banks of Berlin for 1913 were four and three-tenths times their actual capitalization, whereas at the end of 1919 the obligations had reached twenty times the capitalization.

In 1913 the eight big banks showed miscellaneous expenses and taxes paid to the amount of 96,000,000 marks; at the end of 1919 this item had increased to 438,000,000 marks. Gross surplus in 1913 was stated at 227,000,000 marks, and at the end of 1919 gross surplus had increased to 689,000,000 marks. In other words, as between 1913 and 1919 expenses increased 354 per cent and surplus 208 per cent.

The high taxes which will have to be paid for 1920 will undoubtedly reduce the deposits in the banks. The expenses of the banks in doing business, however, can hardly go down to the same extent, since the prevailing living conditions permit of no reduction in salaries. Nor is it likely that the rate of interest paid on deposits will be reduced, unless paper money continues to accumulate. An equal-

ization and stabilization of banking conditions can only be obtained by enlarging the basis for credit transactions; and this is a possibility, inasmuch as manufacturers and traders will be in want of banking credits on account of increased taxes and still higher prices.

German Trade Influence in the Argentine.

The German-Argentine Economic Union lately published a report in Der Welt Handel pertaining to the work accomplished in the interest of Germany's trade with the Argentine. Some extracts from this report are condensed as follows:

The development of the Argentine during the war and her bright prospects for the future have strengthened the desire in German industrial and capitalistic circles to participate in Argentine affairs. As early as the middle of 1918 Mr. Walter Schorr and Mr. E. C. Jaaks began to work through the German Chamber of Commerce in Buenos Aires for the establishment in Argentina of German processes and methods. Particular study was given to all industries now operating in this South American Republic with a view to determining what particular German industries might be transplanted. The German plan is to use not only capital and men who are experts in various lines of mechanical, industrial, financial, and scientific lines, but also to operate in Argentina under the protection of patents taken out there. By bringing Argentine capital into manufacturing businesses goods could be made and sold in Argentina, and these enterprises would naturally buy their machines, apparatus, chemicals, and perhaps even some raw materials from German sources. The paper says:

Much will be gained if Germany succeeds only in selling patents and licenses or in transferring German methods, processes, and experience, and in supplying the industries in Argentina with the necessary technical administration. There exists at the present time, for example, a large number of articles in the foodstuffs line and other goods in large volume but of little value which can no longer be exported from Germany; but instead of watching helplessly while other nations usurp Germany's former position, Germany ought to hustle more and cooperate with firms of German-Argentine origin. Promotion of industries in Argentina by German capital would also provide possibilities for a large staff of German engineers, chemists, and business men, and would give workmen an opportunity to emigrate and settle in the Argentine.

The paper further frankly says:

A large number of German capitalists who fled to neutral countries to avoid taxation are now awaiting only a favorable opportunity to get to South America.

As a working basis Mr. Jaaks, who is now in Germany, suggests the formation of a joint-stock company, to be known as the "Compania Argentina de Fomento Industrial," which company would not alone support already existing industries in South America, but whose chief object would be the organization of new concerns. There is in Germany an organization known as the "German-Argentine Central Committee"; this committee assisted in the organization of the "Com-

pania Argentina de Fomento Industrial," and a board of directors was elected, including certain Germans now residing in South America, among whom are Hugo von Bernard, Dr. F. Kade, Oscar Scheffel. Many German firms manufacturing pharmaceutical goods, chemicals, etc., have joined this organization. It will operate not only along the River Plate but in Chile.

Inasmuch as the present value of the mark prevents the large participation of German capital, the Argentine branch of this German society will for the present do the financing. For the present the main object of the undertaking will be the establishment of factories for the working up of raw materials of vegetable, mineral, and animal origin produced in the Argentine and neighboring countries by the introduction of new ways of manufacture and processes. Particular attention will be given to leather, textiles, and paper, the protection and utilization of textile fiber, the utilization of corn as a food, the working up of vegetable and animal fats, the production of artificial butter, the production of certain vegetable alkaloids, of tartaric acid ($C_2H_6O_6$), of tanning substances and dyestuffs; also researches as to the utilization of by-products from the wine and sugar industries; the utilization of wool fat and the production of petroleum derivatives.

For giving advice to interested parties in Germany the German-Argentine Union has established a special office in Berlin, where German manufacturers can get all necessary information and advice as to answering the industrial field in the Argentine.

The underlying policy seems to be one of close cooperation and actual partnership with Argentine capital.

Government Attitude Toward Stagnation in Industry.

On August 9 the Federal Economic Council met to discuss ways and means for bolstering up stagnant German industries. In outlining the situation Referent Wissell expressed the opinion that stagnation in the trades is not so much to be attributed to the so-called purchasers' strike as to the fact that prices have actually become so high that the mass of buyers can not meet them. The primary reason for high prices, he declared, lies in the high cost of raw materials. Referring to the question of reducing the present high scale of wages, it was stated that this would only result in reducing the purchasing power of the people.

Relief in certain industries will be sought for by the placing of orders by given communities and trade-unions; in the shoe industry, for example, the Government has arranged to purchase about 500,000 pairs of shoes by guaranteeing to the factories the wages of the workmen, the shoes to be sold at an average price of 120 to 125 marks per pair.

At the end of the session a resolution was passed embodying the following provisions:

1. The closing down of factories or the restriction of production, or the sale of machinery used for production, can not be consummated without first obtaining permission from the proper State authorities.

2. The necessity for closing down a working plant must first be investigated by a committee of economic experts, which committee will include the representatives of the working men. This committee will have authority to reopen the plant if it is deemed necessary, and to take measures for the resumption of work by providing for public or community orders through the intermediation of the trade organization which was effected. In general, the cooperation of all trade-unions concerned will be sought in an effort to keep plants running. Export licenses will be granted only when home requirements have been met.

3. If an owner shuts down his factory contrary to the wishes of the committee, and refuses the assistance described in section 2 above, the committee shall have the right to reopen the plant and run it or to lease it. In cases of emergency coal and raw materials can be transferred from one plant to another, as decided by the committee.

4. In future the authority for carrying out the regulations of the Economic Council will be centralized so far as possible.

5. If the price for certain raw materials in Germany should rise to a point above the world market prices (by reason of the depreciation of the mark) the export of that raw material will be prohibited.

6. During any period of reduced working hours caused by this economic crisis, such workmen as suffer by the enforced idleness shall receive a pro rata compensation from the funds of the Union's Unemployed Welfare Commission.

7. The committee shall have authority to determine whether or not price reduction is being interfered with in any way by trade associations.

Increase of Flax Production in South Germany.

It is reported from South Germany, according to statistics published by the economic departments of Wurtemberg and Hohenzollern, that flax growing has considerably increased in those regions during the past three years. In 1917, 9,800 hundredweight of hemp and flax was produced; in 1918 this amount increased to 38,000 hundredweight, and in 1919 it increased to 45,000 hundredweight.

Changes in the Steel Industry.

In its issue of August 11 the Frankfurter Zeitung discussed changes in the steel industry. According to a report of the English Iron and Steel Institute, Bessemer steel, which was largely used during the last years of the war in place of iron, is now being gradually supplanted

by Martin steel, owing to improvements made in the Siemens-Martin furnaces which has resulted in cheaper production. In Germany, Martin steel finds a strong rival in Thomas steel, and Bessemer steel is produced only in a small extent. The following table shows the comparative increase in the production of Martin steel since 1913:

	1913		1918	
	Tons.	*Per cent.*	*Tons.*	*Per cent.*
Thomas steel (ruck bars)	10,529,697	56.2	6,410,751	42.8
Bessemer steel (ruck bars)	155,138	.8	148,980	1.0
Martin steel (ruck bars)	7,613,904	40.2	6,777,906	45.3
Miscellaneous	536,350	2.8	1,641,868	10.9
Total	18,935,089	100.0	14,979,505	100.0

Conditions in the Gold and Silversmith Industries.

The jewelry trade, says an article in Industrie und Handels Zeitung of August 8, is one of the first to suffer during any economic crisis. In the same way the jewelry business flourished exceedingly during the inflation which swept over Germany in the winter of 1919-20. Now, however, due to the stabiziling of exchange and a general stagnation of business, the jewelry trade is practically dead. The writer of the article follows the popular practice of blaming the Versailles Treaty and the Spa Conference for the dullness in the jewelry trade. The article further states that Germany, having been shut out from the world markets for some six years, has seen her place in the jewelry export trade taken by the maunfacturers of Birmingham, Paris, Switzerland, and the United States. Spain and South America, once good markets for the consumption of German jewelry, are lost for the present, and in Germany itself, of course, because of present conditions, few people are buying jewelry. High prices which prevail here and the uncertainties of delivery have also discouraged foreign buyers. With a hope of improving their condition, a number of large German jewelry firms are beginning to send their salesmen to South America and Spain in an endeavor to reopen old relations.

For many obvious reasons it is not possible to convert German jewelry manufacturing plants into factories for the production of any other line. In Pfortzheim, the center of the German jewelry industry, 35,000 out of the 70,000 inhabitants are employed in the precious-metal industry. In prewar times the Pfortzheim factories enjoyed an output of 200,000,000 marks worth of jewelry a year. During 1919 and the early months of 1920, when inflation was at its height, Pfortzheim was selling jewelry at a rate of about 2,000,000,000 marks per year, this enormous increase being accounted for not so much by increased turnover as by the depreciation of the mark. In normal

times three-fourths of the jewelry manufactured in the southwest German cities was produced for export.

Mines in Upper Silesia in 1919.

The Oberschlesischs Berg und Huettenmaennische Verein, E. V., has published a statistical report covering the year 1919. Excerpts from this report show that in 1919 there were 63 anthracite coal mines operating in Upper Silesia, wherein 1,835 steam-hoist engines were used. Three hundred and eighty-eight electric motors were in use as against 405 in the preceding year. The following table gives an idea of the work and production in these mines:

Year.	Number of workers.		Working days.		Quantity of coal hauled up.	Annual quantity in tons hauled up per man.
	Male.	Female.	Total number in million days.	Quantity of coal hauled up per day.		
1913	118,002	5,347	36.8	298.5	43.8	355.1
1916	122,935	12,032	40.6	300.9	42.0	311.7
1918	136,073	14,037	45.0	300.2	39.9	266.3
1919	133,733	13,408	41.6	282.8	25.9	176.2

Thirty-five per cent less coal was produced in the mines in 1919 than in the year previous. In other words, 21,204,043 tons of coal were shipped from these mines in 1919 as against 36,113,360 tons in 1918 and as against 40,337,815 tons in 1913.

Iron production has decreased 73 per cent in the last 10 years in Upper Silesia, as is shown by the following tables:

Year.	Tons.	Marks.	Year.	Tons.	Marks.
1901	457,126	3,130,095	1918	62,194	593,463
1913	138,204	917,599	1919	61,429	937,341

Pig-iron production and the consumption of coke in connection therewith is shown by the following table:

Year.	Pig iron.	Coke consumption in the production of 1 ton of pig iron.
	Tons.	*Tons.*
1913	994,601	1,335
1918	696,146	1,395
1919	459,954	1,581

The value of pig iron and its by-products amounted to 186,420,000 marks in 1919 as against 125,890,000 marks in 1918. Foundry production declined 30 per cent in 1919 as compared with 1918. Upper

Silesia produced 24,451 tons of steel castings in 1919 as against 97,757 tons in the previous year. In 1919 the same district produced 439,227 tons of ingot iron, or only 34 per cent of the production in 1918. The production of wrought iron decreased by 51 per cent. Seventy-four thousand and twenty-three tons of crude zinc, valued at 138,608,000 marks, was produced in 1919 as against 122,961 tons, sold at 110,890,000 marks, in 1918. The production of lead in Upper Silesia in 1919 was 17.7 per cent less than that of 1918, and the production of silver declined by 27 per cent.

The total number of miners employed in Upper Silesia in 1919 was 226,445. The highest number of miners previously employed was in 1917, when 237,489 men were at work in the mines; after the repatriation of war prisoners this number was reduced to 233,339. Among the miners employed here in 1919 was a large number of Russian prisoners of war, who are now regarded as settled workmen.

German Fairs.

In discussing the numerous fairs to be held in Germany in the autumn of 1920, a writer in the Industrie und Handel Zeitung says:

> Argentine merchants take no interest in these German fairs now because they are kept closely informed as to what the German market has to offer and what is needed in the way of imported raw materials by the various German firms and traveling salesmen who are now active in Argentina.

The writer further points out that it has now become a matter of the greatest importance that German exporters who make contracts should live up to these contracts in every detail as regards prices, dates of delivery, and quality of goods, and that German importers should arrange for prompt payment or give ample security for the payment of goods imported from the Argentine. The failure of the German merchant to live up to his contract, says this writer, still often impairs the good understanding between overseas merchants and the German dealers.

Luxemburg's Coal Supply.

In its issue of August 12 the Frankfurter Zeitung, in sketching an outline of the industrial situation in Luxemburg, says that this small but busy country is seriously affected by the terms of the Spa agreement. Luxemburg is to receive 90,000 tons of coke per month from the quantity which Germany must deliver to the Entente. Although this will place the iron industry of Luxemburg in a better position, she will have no advantage over France or Belgium. Luxemburg's coal consumption in 1916 amounted to 2,675,754 tons; in 1917 it was 2,175,892 tons, and in 1918 it had dropped to 1,808,790 tons, and in 1919 it was 840,000 tons. In other words, the quantity of coke allotted to Luxemburg will cover not more than one-third of her normal requirements and her industries will be affected accordingly.

German Cement Prices.

The German Government has fixed new prices for cement in Germany, beginning August 1. A consideration of the development of the cement prices in Germany since the outbreak of the war is interesting. In lots of 10,000 kilos cement was sold at the outbreak of the war for 350 marks. When the Government took over the control of this industry on January 1, 1917, it raised the price to 430 marks. By April 1, 1919, this price had reached 885 marks, and by April 1, 1920, it had reached 3,991 marks. Under the new official price list issued August 1, 1920, the price of German cement in lots of 10,000 kilos is fixed at 330 marks, showing the first decline since August, 1914.

FRENCH NAVAL BUDGET, 1920—PART APPLICABLE TO FRENCH NAVY.

Source: Reliable.

(13262.)

13 August, 1920.

Not much information concerning details can be given until the part applicable to the Navy appears in extenso. The following is obtained from the Journal Officiel. The money appropriated for the Navy appears under two titles:

	Francs.
Title I. General administrative expenses	620,396,182
Title II. New work, naval war supplies	131,804,500
Total for the minister of the marine	752,200,682

Title III is thus itemized:

Miscellaneous supplies for the fleet, naval war supplies—Heavy equipment	683,000
Naval construction—New constructions—Salaries	7,600,000
Naval construction—New constructions—Material	23,700,000
Naval construction—New constructions by private companies—Purchases	14,500,000
Naval construction—New constructions and supplies—Torpedoes and mines	5,500,000
Naval construction—Heavy equipment—Purchases and new installations—Transformation of shops and shipyards	14,060,000
Naval artillery—New constructions and supplies—Salaries	2,800,000
Naval artillery—New constructions and supplies—Material	11,000,000
Naval artillery—Heavy equipment—Purchases and new installations—Transformation of shops and yards	4,775,000
Naval works—Military and general buildings—New works and major improvements	2,471,000
Extraordinary work at naval ports and bases of operation of the fleet	14,001,000
Medical department—New constructions—Buildings—Supplies for mobilization	714,500
Naval aeronautics	30,800,000
Total for Title III	131,804,500

In connection with the adoption of the budget there is appended hereto the translation of a speech delivered by Mr. Henry Berenger, chairman of the naval budget of the Senate. It is believed this speech will be found interesting.

Mr. Henry Berenger, chairman of the naval budget: The observations which the chairman of the finance committee has to present relative to the naval budget will be extremely brief. We have not at our disposal at this moment, the time necessary for the thorough consideration of a problem so complex and so formidable in its bearing on the national defense. Nevertheless, the finance committee has been struck, in the consideration of this budget, amounting to nearly a billion francs, this despite the numerous eliminations which have been made, eliminations at times arbitrary and disquieting respecting constructions and fuel supplies, the committee, I say, has been struck by the present state of the French Navy.

The budget discloses to us no future perspective concerning a technical program; it is a budget which the naval editor of the Temps, an eminent and informed journalist, qualifies as one of abandon and oblivion. I shall not go to that extent; I consider it rather a budget of stagnation and waiting. [Cries of "very good."]

The situation in which the entire world finds itself at this time may justify, in a certain measure, this policy. Europe is struggling with problems which are being renewed incessantly. The armistice is no sooner signed than suddenly guns are discharged apparently through their own initiative, and the treaties of peace which have been concluded are interpreted by renewals of wars. As well in the Eastern Mediterranean as in the Northern Baltic, our navy has had to enact an active rôle. It has therefore been necessary to avail ourselves both of still existing material and of that which remained of our crews in order to accomplish this rôle, and we have had to send naval forces a little everywhere on extraordinary missions.

Would it be possible, under such conditions, to formulate a new naval program? Such is the question which we propound to the Minister of the Marine, and we are very anxious that he should be kind enough to present the Senate with a definite answer. In what condition at the present moment are the complements of our vessels, likewise the personnel of our navy yards—that is to say, the two vital organs of any navy, to which in the name of finance committee and in the name of the Senate—with the kind permission of the latter—I am happy in this Assembly to be able to render the homage which is their just due? [Loud applause.]

Yes, gentlemen, since it is likewise the first time since the termination of the war that we have a formal budget, your chairman feels obliged to say that the ships' crews and the navy yards have silently, stoically, and at times heroically, worked during the war. ["Very

good!" "Very good!"] They have had no press advertisement. Yet, however, what an arduous rôle, from the trawler to the flagship, these vessels have had to assume, when the endless chain of supplies had to be assured. As well to the great commanders as to the modest fishermen; to the entire admirable maritime population of France; to our old French Navy, the school of highest obligations, it were necessary to here render the homage which is their just due, because it is the first time we have been able to do it since the war terminated. ["Very good!" "Very good!" Applause.]

At the present moment, in these crews and navy yards—we must not delude ourselves—there reigns a certain uneasiness, a certain discontent, a certain rancor. Why? Because there exists an impression of a retarded life; because one does not see opening up before their impatient activities the horizon of a navy in process of construction, a navy which maneuvers, a navy which cruises. [New mark of applause.]

As in our great navy yards, which have brought forth admirable creations like the *Jean Bart*, to which the English Navy has rendered justice from a technical point of view, so in our large metallurgical establishments, in our maritime crews and throughout out fleet, the officers and engineer officers, likewise the laborers and sailors, all are asking: "What is going to happen to us? What are we going to do? We can not remain in this present situation."

The fundamental law of 1912 has created a program for the French Navy. This law recontinued, in unison with the program of the old French monarchy, at the same time extending its maritime program. It may be recalled, in this respect, that the Third Republic, in creating our colonial Empire, had created maritime obligations, just as the two Colberts, father and son, in creating the first colonial empire of the monarchy, had been led by this very fact to the obligation of creating the French Navy [applause]; so, later in the eighteenth century, when the Duke de Choiseul insisted on extending the French colonial empire, he was likewise led to conceive and to continue the restoration and development of our navy. Now, that, after the victory, our colonial empire has become extended; now that, through our old and new colonies, we are organizing in every continent a new France, the France of beyond the seas, rich in means, in men and things, all necessary to us in view of the eventualities of to-morrow, as well in peace as in war, we are induced to say: Our colonies will ever be menaced if we have not a powerful navy. [Applause.]

Mr. Eugéne Reveillaud: We need a colonial navy.

The Chairman: The fundamental law of 1912 had contemplated the construction of large battleships which are to-day abandoned. It

has also contemplated scout cruisers and submarines of a certain type. But it must be admitted the teachings of the war have changed many things. We are viewing to-day in the world a sort of race in which new and terrible armaments are competing. On the one hand the United States have, in a resolution of the General Board, reproduced in the last annual report of the Secretary of the Navy, announced their determination not to leave the control of the sea to any navy. Mr. J. Daniels expressed himself thus:

> Since 1915 the General Board has formulated and adopted this naval policy, that the United States fleet must, definitively, be equal to the most powerful maintained by any other nation in the World. It will gradually be brought to this point by a year-to-year development, regulated according to the resources of the country, but the object to be obtained must not be achieved later than in 1925.

Thus, gentlemen, at the moment when the President of the United States was pronouncing himself in favor of universal peace and the organization of the Society of Nations, the responsible Minister of the Navy of the United States was formulating a naval program, a brief summary of which you have just heard. He did not content himself with merely formulating it; all the naval shipyards brought into being during the war are at work. At this moment in which I am speaking, great superdreadnaughts which will carry 457-millimeter guns are already under construction; a fleet of 14 superdreadnaughts more powerful than those of the powerful *Albien* will be ready in 1925.

For her part, England declares—she does not content herself with declaring it, she is acting—that she will continue to construct a fleet as powerful as the most powerful in the world.

Japan is preparing herself, also, under impressive conditions of magnitude and tenacity. And, still more serious for Europe, all these great fleets, all these great superdreadnaughts—which are now going to attain or exceed 50,000 or 60,000 tons, carry the guns of which I speak, and be accompanied by a whole cortége of destroyers and submarines—will navigate, no longer impelled by that old combustible, coal, now out of date for a large navy, but by that modern combustible, petroleum, alike applicable to naval warfare and peace.

Now, the interallied conference concerning petroleum which operated for the Allies during the war has established the fact that we should have been able neither to carry on nor win the naval war against Germany if we had not had the petroleum market of America. The output of this market rose to the proportion—which has been very exactly calculated—of 87.5 per cent of the supply: That is to say, that out of 5,000,000 of tons of heavy oil which were necessary for the Allied fleets, there was something like 4,300,000 tons that came from America.

Then, if the race for sea power is thus inaugurated between the United States on the one hand and Europe on the other, or at least Great

Britain, and if the American superdreadnaughts are capable of controlling the Caribbean Sea at the same time as the Atlantic Ocean, the 87.5 per cent of petroleum which supplied the Royal Fleet can no longer come either from Mexico or from the United States, should it thus please the latter.

Under these circumstances, gentlemen, Great Britain might entertain in her roadsteads the most magnificent superdreadnaughts, have the largest reservoirs, she would have nothing to store in them, and all these dreadnaughts would be nothing more than scrap iron at the moment it pleased the United States to establish the control of petroleum throughout the two Americas.

We have a situation which is of a nature to absorb the thought of France. Certainly France, between her two allies and associates, is not called upon to pose as a rival; she could not do it in a material sense and she does not desire to do so morally. France must preoccupy herself simply with remaining the France victorious; that is to say, with organizing, with a view to all the eventualities of both peace and war, a complemental navy to be supplied by her colonies and her alliances. [Applause.]

But it is easy to comprehend that, if she no longer has anything ["Very good!"]; if there be no naval program; if there be even no longer any battleships and no more modern cruisers; if there be no submarines, France will have nothing to oppose, not even to propose as a nucleus, in the conflicts, in the competitions or in the associations of peoples which will certainly result in the world just regenerated and unsettled by the last war. ["Very good!"]

We ask of you, Monsieur le Ministre, to inform and reassure the Parliamentary assemblies, which have never refused any appropriations necessary to the country's navy. We desire to ask you if, in your general staff, there is being prepared, in actual fact, a naval program; if you have clearly and decidedly confronted the general situation of which I have just indicated the broad lines? The entire naval budget is bound up in this and must serve only to this end. ["Very good!" "Very good!"]

For a country like ours, which, victorious as she is, has been drained in its finances as well as in its population, to yield a billion francs per year—and probably more next year—to its navy is a great sacrifice which we make alike to our traditions as to our hopes; but we insist, at least, that this financial sacrifice corresponds to the profound realities. ["Very good!"]

To this question there is closely linked another, not less absorbing for the Parliamentary assemblies; it is that which you have already touched upon—the cession to private industry of two of our large arsenals and one of our metallurgical establishments. ["Very good!"]

Mr. Eugéne Reveillaud: I request the floor.

The Chairman of the Financial Committee (continuing): Your high technical boards, the general staff and the superior council of the navy, in February last, considered that we had too many arsenals and naval establishments. That is quite possible, and I am convinced, moreover, that these great technical organizations, responsible for the naval and military security of France, have only rendered their opinion after a most profound examination of the question. You yourself have arrived at a decision along this line, and private industrial concerns have been invited to tender offers; up to the present moment, I know that no serious offer has been presented, but it is evident that the problem is pending.

If the naval program of to-morrow does not carry with it, in point of fact, an utilization of all the equipment that France had accumulated for its old programs; if, in reality, this naval program can be realized without enormous expense of material and personnel, which these old governmental arsenals represent, surely the Parliament would not persist in requesting their continuance for purely local reasons.

Mr. Alfret Brard: That is the truth.

The Chairman (continuing): That is indisputable. The patriotism of the Assemblies has always been equal to the necessities of the occasion, and if, in reality, the technical program which shall have been prepared by the general staff and by the superior council of the navy, does not include the maintenance of six large navy yards, we shall be able, all of us, to make the necessary sacrifices.

But at least it is essential that we should know if there is in reality a coordination between this cession of the navy yards, which is being considered, and the naval program of which we were just speaking! That is why, I repeat, no matter from which direction we view it, whether from the point of view of the budget, for the estimation of the expenses really useful to the national policy, or whether it be from the moral point of view, for the efficient upkeep of our crews and our shipyards, whether it be finally from the technical side, for the logical organization of our equipment and of our naval fabrications, it is absolutely indispensable that the Parliament be presented without delay with the naval program which your general staff must have prepared. [Applause.]

Mr. Eugéne Reveillaud: This question can not be decided within the scope of the budget.

The Chairman (continuing): That the Parliament be presented with the naval program, is so much the more important—it is here that I terminate—in that, if, formerly, it might be considered that the Navy of France served more especially for the defense and stimulous of her commerce and colonies, something much more serious is now at stake. It is no longer now the commerce and colonies, it is the

defense of France herself which is linked with the power of the navy. ["Very good!" Applause.]

The great lesson of the war—this is the only consideration that a chairman of the finance committee can here present in terminating—the great lesson which results from the war is that, without doubt, France has for principal mission the safeguarding of the Rhine; therein is the rôle of France along the line of general civilization. But how has France been able to assure the defense of this frontier of civilization of which President Wilson spoke?

How, at this time, could she maintain the guard of the Rhine if she had not behind her the endless chain of supplies which come from all continents to bear to her over the high seas the raw material and men necessary to its defense? Therefore, a France only having an army in Europe, without having the navy for the protection of its supplies coming from other continents, would be quickly exhausted and paralyzed.

Here we have the great lesson which results from the war which we have just concluded. If, for our ancestors and our predecessors, the problem were more especially "colonies and navy," defense of the colonies by the navy, it would be for us and our children still more serious, since between the national army, which will have the task of defending civilization against the aggressors from the east, and the national navy, which will have for its mission that of replenishing this army in steel, in petroleum, in coal, in cereals, in provisions, in cotton and in supplies of all description, in native contingents of soldiers and workmen also, there can not be, henceforth, separate programs; there must be hereafter a constant technical and administrative coordination.

To have a vast military program without having a corresponding naval program, after the tragic warning of the six years which we have just traversed, would be a national violation of good sense; still more, it would be a national weakness. ["Very good."]

We are convinced that this question has been considered not only by the general staff and the superior council of the navy, but also in higher spheres, in the councils of the Government of the Republic, and we desire to believe that the Minister of the Marine, to whom we here confide all our amicable confidence, and who is one of the responsible members of the superior council of national defense, has viewed this problem in collaboration with his colleagues of the Government at its fullest extent, in all its complexities and in all its urgency. ["Very good!" Applause.]

We request, therefore, without delay, a technical program for an active navy, a program which shall be drawn up in coordination with the French Army and its supplies both in peace and war. ["Very good!" "Very good!" Applause.]

IMPROVED SPEED INDICATOR OR TACHYMETER FOR SHIPS OR AIRCRAFT.

Source: Reliable.

The following description of an apparatus designed to keep and record the reckoning in air or surface craft is published because of its possible interest to the service.

Many attempts have been made to construct speed indicators for ships and aircraft based upon the acceleration principle, i. e., apparatus wherein the position of the speed indicating member is at any moment determined by the algebraic sum of all previous accelerations and retardations, each multiplied by the time during which it has prevailed.

Apparatus of this character have been proposed wherein the accelerations and retardations should be determined by means of a pendulum, but it is obvious that such apparatus can not give satisfactory results. For seagoing vessels, for instance, the use of a pendulum for the purpose stated is altogether out of question, seeing that the oscillations of the pendulum, owing to the comparatively slight speed variations, are so exceedingly small that they can only be registered by complicate and highly sensitive mechanism. Moreover, said oscillations form only a fraction of those angular movements from speed variations caused by shocks, or by the rolling and the pitching of the ship, whereby the said slight oscillations which it is intended to register are completely absorbed in the considerable frictional resistances due to the last-mentioned movements of large amplitude.

It is pertinent to remark that the disturbing movements of the ship have a very short duration relative to those from speed variations. Therefore, the above inconvenience might be met by the use of a pendulum, the duration of oscillation of which considerably exceeds that of the ship, but this would necessitate the employment of pendulums having an enormous length, or of pendulums which for other reasons are impracticable.

The disturbances from the ship's movements may be avoided if the speed variations are determined from the oscillations of the plane of rotation of a gyroscope which is flexibly coupled with the ship at some axial distance from its centre of gravity. For the purpose stated a gyroscope has the advantageous feature that speed variations caused by shocks from the pitching and the rolling of the ship do not entail changes in the plane of rotation. It is well known from the properties of a gyroscopic disk that when once set in rapid rotation in a given plane it will tend to maintain its position in said plane, and will violently resist any sudden efforts to displace it from that plane, but that it yields perfectly to any gradually impressed force, and that the said yielding of the gyroscope axis takes place in a direction at right angles to the direction in which the gradually

impressed force acts. Moreover, angular movements of a gyroscope under the influence of gradual speed variations take place with considerable force, so that all frictional resistances are positively overcome.

As a matter of course the use of a pendulum necessitates the employment of an exactly horizontal plane with respect to which the pendulous movements should be determined. It is well known in the art, however, that it is practically impossible on board of ships to maintain such a horizontal plane, and it is for this reason that tachymeters in which the speed variations are determined from the oscillations of a pendulum can not be made reliable.

My present invention relates to a tachymeter of the character referred to, and in which the above advantageous features of a gyroscope are embodied. According to my invention, the necessity of employing an invariably horizontal measuring plane is completely avoided by using instead of one single gyroscope two equal gyroscopes turning in opposite directions and suspended in such a manner that their axes are in parallel relation to one another when the apparatus assumes its inoperative or no load position. It is clear that in this case a given change in the speed (acceleration or retardation) will cause oppositely directed and equal angular movements of the gyroscope axes, whereby the one gyroscope may be used as measuring plane for the other and vice versa. Another advantageous feature of the improved apparatus resides in the fact that an angular movement caused therein by a given change in the speed is twice that in apparatus provided with one gyroscope only.

I shall now proceed to describe, by way of example only, an embodiment of my invention, reference being had to the annexed drawing in which figure 1 shows an elevational view, partly in section, whereas figure 2 illustrates a detail.

The speed indicator proper is mounted on a table 1 corresponding to the chart of a gyroscopic compass, for instance, of the Anschutz— or Sperry-type. That is to say, the table 1 is carried by a float 2 supported on mercury in a receptacle 3, and maintained in an invariable horizontal position by means of three gyroscopes 4 associated therewith. The gyroscopes 4 are rotatably mounted on horizontal shafts set under angles of 120° to one another. The float 2 is carried by a point 5.

The table 1 is provided with two diametrically opposed recesses for receiving a ring 6 and 7 respectively which are mounted on journals 6^a and 7^a respectively pointing true north and south. Suspended from each ring 6, 7 is a horizontal gyroscopic disk 8, 9 respectively, through journals 8^a, 9^a pointing true east and west. Said gyroscopic disks 8, 9 have equal masses and sizes, and are driven with equal and constant speeds in opposite senses.

Fig. 1.

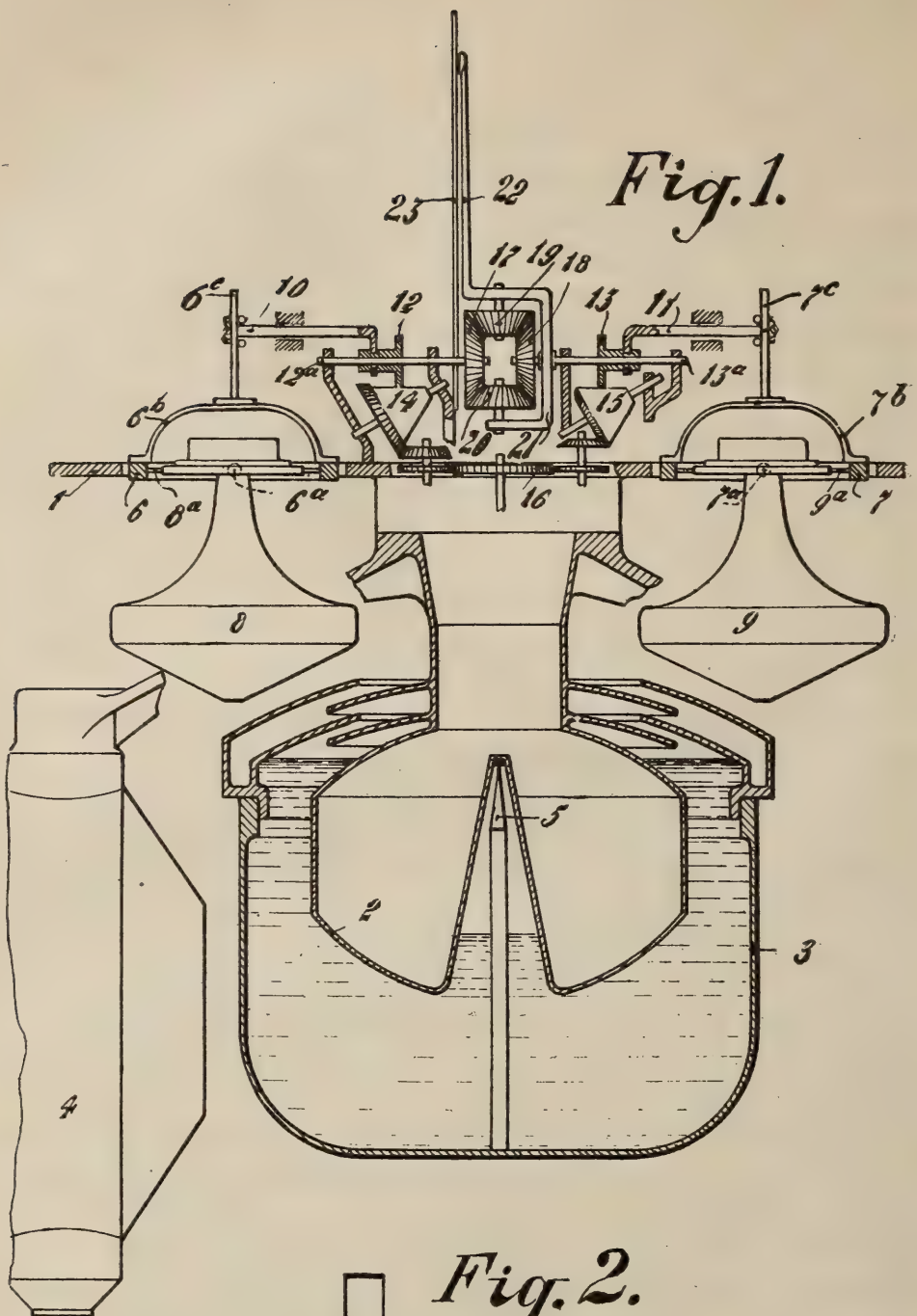
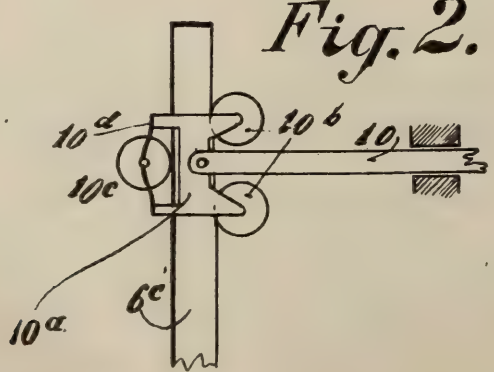

23
22
17
19
18
6c
10
12
13
11
7c
12a
13a
14
15
6b
7b
20
21
1
6
8a
6a
16
7a
9a
8
9
5
2
3
4

Fig. 2.


10d
10b
10
10c
10a
6c

Connected with each ring 6, 7 is a frame or loop 6^b and 7^b respectively rigid with a rod 6^c and 7^c respectively in alignment with the axis of the corresponding gyroscopic disk. Slidably mounted on said rods are arms 10 and 11 respectively, having freedom of rectilinear motion exclusively in the direction east-west in parallel relation with the table 1. To this end the arm 10 is pivoted to a carriage 10^a, see fig. 2. Said carriage engages the one side of rod 6^c through rollers 10^b mounted on fixed shafts, a third roller 10^c loaded by a spring 10^d serving to ensure permanent contact between the carriage and the opposite side of the rod 6^c. The connection between arm 11 and rod 7^c is similar to that between arm 10 and rod 6^c.

The arms 10, 11 are coupled with friction wheels 12 and 13, respectively in such a manner that these wheels must follow the rectilinear motions of their arms, but are adapted to freely revolve about their axes. The wheels 12, 13 may be spring loaded and are held in contact with rotatably mounted cones 14 and 15 respectively, the axes of which are disposed with respect to the table 1 at an angle equal to half the vertex angle. The cones 14, 15 are driven with equal and constant speeds through mitre wheels by a gear 16 mounted on the shaft of a suitable motor (not shown), for instance, a clockwork.

The wheels 12, 13 are slidably mounted but secured against rotation on shafts 12^a and 13^a, respectively, the ends of which carry mitre wheels 17 and 18, respectively, of a differential gear. The planet wheels 19, 20 of said differential gear are supported in a frame 21 secured to which is a pointer or hand 22 adapted to travel over a graduated chart 23.

The apparatus is so arranged that when the wheels 12, 13 are disposed at equal distances from the vertices of their cones 14, 15 the differential wheels 17, 18 are turning at equal speeds in opposite directions, so that the pointer 22 is stationary.

To fix the idea, let us assume that the ship on which the described apparatus is mounted, is moving at constant speed in the direction north-south, then it will be understood that the axes of both gyroscopes 8, 9 are perpendicular and that the pointer 22 is stationary. Now, any speed variation (acceleration or retardation) produces a force having a tendency to impart to the axes of the gyroscopes an angular movement about the journals 8^a and 9^a, respectively. This obviously causes the gyroscopes to oscillate in a direction at right angles to said force, that is to say the gyroscopes and the parts associated therewith move through equal angular distances about the journals 6^a, 7^a. The direction of angular movement of the gyroscopic axes depends upon the direction of rotation of the gyroscopic disks, and this angular movement is known as the "precession". Seeing that the one gyroscope is turning in a clockwise and the other

in a counterclockwise direction, the angular movements of the rods 6^c, 7^c are also oppositely directed to one another, whereby the arms 10, 11, and also the friction wheels 12, 13 move through rectilinear paths along the cones 14, 15.

Owing to the construction of the speed change gears 12, 14, and 13, 15 the rotary speed of the differential wheel 17 is increased, that of wheel 18 decreased, or vice versa, whereby the pointer 22 is moved in the one direction or the other. This angular movement of the pointer, the degree of which is obviously a function of the speed variation and of the duration of said variation, is a standard for the speed to be measured.

The wheel 12 always moves through a horizontal distance which is direct proportional to the tangent of the angle through which the axis of the gyroscope has moved. As the acceleration (or retardation) is also proportional to said tangent it is obvious that the length of rectilinear movement of the wheel 12 along the cone 14 is proportional to the speed variation itself.

It will be understood that swaying disturbances to the table 1 do not interfere with the correct operation of the speed indicator. An oscillation of said table about an axis parallel to the journals 6^a, 7^a causes a displacement of the wheels 12, 13 relative to the cones 14, 15, but seeing that these displacements are in the same direction they do not entail an angular movement of the pointer 22, whereas an oscillation of table 1 about an axis which is parallel to the journals 8^a 9^a, does not cause any movement of the wheels 12, 13 along their cones even if only one single gyroscope were used. The speed may therefore be closely and accurately indicated without using a horizontal table.

From the above it follows that the described apparatus indicates the speed of the ship in a direction north-south only. If it is desired to determine the distance through which the ship has moved in said direction, all that is required is associating the pointer 22 with a second time integrator. As a matter of course, however, it is also necessary to measure the distance through which the ship has moved in the direction east-west in order that both latitude and longitude may be indicated and registered. Both values may be determined by using one single set of gyroscopes as described, and duplicating the indicating gear.

If the speed indicator proper is rotatably mounted on the table 1, the apparatus may operate in any course.

Claims.

(1) Speed indicator for ships and aircraft based upon the acceleration principle, characterized by the provision of two equal gyroscopes rotating in opposite directions and coupled at some axial distance

from their centres of gravity with the ship or the like in such a manner that their axes are in parallel relation with one another when the apparatus assumes its inoperative or no load position.

(2) Speed indicator as claimed in claim 1, characterized by this, that each gyroscope is pendulously suspended from means pivotally connected with the ship or the like along a horizontal axis at right angles to the axis or the like along a horizontal axis at right angles to the axis of the gyroscope, said means being coupled with mechanism by which its oscillations may be integrated between certain time limits.

(3) Speed indicator as claimed in claim 2, characterized by this, that the means from which the gyroscope is pendulously suspended carries a rod which in the inoperative or no load position of the apparatus is in alignment with the gyroscopic axis and coupled through a member which is slidably mounted thereon with means adapted to move along a rectilinear path in parallel relation with the pendulum axis of the vertically depending gyroscope, said means coacting with a change speed gear in the coupling between a motor and the one differential wheel of a differential gear, the planet wheel of which is associated with the speed indicating member.

FORTY-NINE DAY TRIP FROM MOJI TO JAPANESE ISLANDS IN THE SOUTH PACIFIC, APRIL, 1920 (MADE BY A MISSIONARY).

Source: Reliable.

(13324.)

5 August, 1920.

The Nippon Yusen Kaisha Line runs a monthly service of steamers to the islands. Steamers chartered by Japanese Admiralty to carry officials, teachers, and Government labor. Coal and provisions is the cargo. Carry civilian passengers if there is space available. Must have permission of admiralty. The steamer, *Matsuyama Maru*, 3,000 tons, is English built and 35 years old. It goes from Yokohama to Bonins, Mariannes (or Ladrones), Carolines, and Marshalls; then back over same route to Bonins, to Moji for coal, and then to Yokohama. There is a bimonthly steamer between Yokohama and Bonins.

Every second month the steamer goes from Truk to the westward (to Palao and Angur), back to Truk, and then north.

Bonins.

Futami (formerly Port Lloyd) is the port of call; it is a settlement of about 1,000 Japanese.

In 1830 an expedition, fitted out by the British consul at Honolulu, arrived at Futami. The expedition consisted of 5 white men, 25 Hawaiian men, and some women. There were no aboriginal inhab-

itants in the islands. Among the white men was Nathaniel Savory, born at Bradford, near Salem, Mass., who was the leader of the group and later elected head of the community. He died there in 1874 in his eightieth year. He married a half-Spanish widow, and had 10 children by her. The eldest daughter married a Portuguese, and her son Joseph Gonzales is now the rector of the Episcopal Church and is married to a Japanese woman. Since the arrival of the Japanese commission in 1875 many of the descendants of the original settlers have left the islands and the others have intermarried with the Japanese.

The total population of the islands in 1915 was about 6,000, but since that time Japanese in considerable numbers have emigrated there.

There is a radio plant behind the town of Futami, consisting of two single masts of about 100 feet in height. The missionary asked permission to take photographs, which was granted. The two Japanese petty officials, talking it over, said "There are no forts—what objection could there be? All right."

Saw no guns or emplacements, no barracks, soldiers, or sailors. No admiralty house and no torpedo tubes.

Mariannes—Saipan.

Saipan is a three-day run at 10 or 11 knots from the Bonins. This town is situated on the open roadstead (simply a long indentation in the coast). The ship anchored about 1 mile from the shore. Town is composed of two settlements, which are contiguous; one of 500 kanakas and the other of 2,000 Chamauros (from Guam, which is 120 miles distant). Four or five miles from either end of the town are two Japanese settlements of laborers, 1,500 in all. The Japanese laborers and the Chamauros work the near-by sugar plantations. The admiralty substation is situated just behind the town on an elevation and the wireless (same plant as in Bonins) is there. There is a naval captain at the admiralty branch, and there is a barracks for some 15 to 20 sailors. No fortifications seen, and no naval craft of any kind.

The coconut trees have been killed by worms. Sugar is exported. The islands furnish bananas and lemons.

Small mountains behind the town, less than 1,000 feet high.

Truk (Carolines).

Three days' steaming from Saipan. Quite a number of the islands in the group are mountainous. Large lagoon surrounded by white coral reef about 130 miles in circumference. The water is quiet. Would hold a navy. There are 70 islands in this lagoon, of which some 10 or 12 are inhabited and worthy of notice. The distance from the northeast entrance to the town anchorage is about 8 miles. A

pilot met the ship outside the entrance (was a Japanese). Admiral Nozaki is in command here. Has about 12 officers under his command. Is very courteous and hospitable. He said: "We have no problems down here. The people are quiet, docile, and well behaved and clothed. Are no longer savages. One-third to one-half are Christians." There are 27 churches in that lagoon in a population of 10,000. Estimated that 4,000 are church members. This good work was done by the American Board of Missions (Congregational) since 1852.

Admiralty is about halfway up a 1,500 foot mountain. The radio station is above sea level considerably and not far from the admiralty. No fortifications in sight. A small cruiser and a training ship were there. The cruiser is stationed in the islands. Japanese have built some roads. There are no mooring buoys in the harbor. There is a naval barracks here for about 100 sailors.

There are three entrances to Truk lagoon.

Ponape (Carolines).

About one-half day's run from Truk. Has a shallow bay. Anchorage behind small island, 50–100 feet high. Standard radio set here. Town is 2 or 3 miles from anchorage, on side of a hill. Branch admiralty house, bigger than most branch houses. No fortifications in sight. No guns or emplacements, torpedoes, mines or ships. Barracks for 20 men. Naval captain in charge. There are 3,000 people on the island. Eight churches.

Kusai (Carolines).

One and one-half days' run from Ponape. Very narrow entrance, tiny harbor. No admiralty house here—comes under Ponape. No officials except post office and tax collector and policemen. Six hundred people.

Jaluit (Marshalls).

There are no mountains here. Land is about 3 feet above sea level. Jaluit is a lagoon with a narrow entrance and big good anchorage. Would hold a fleet. There is an admiralty branch with a radio. No fortifications here; no naval vessels. There is a naval captain in command.

The naval headquarters are shortly to be transferred from Truk to Plao, where accommodations are being provided for the admiralty officers.

One of the traders said in Truk that the Germans had paid 17,000,000 marks for the South Sea Islands and were cursnig themselves ever since; that they are unprofitable commercially and possess no military value.

STRENGTH OF NAVIES OF LEADING POWERS.

Source: Reliable.

If Great Britain holds the ships which she now has, and completes her present building program, the status of her navy will in 1923 be as shown in column I; if she disposes of vessels as now planned, her status will probably be as shown in column II.

	I.		II.	
	Number.	Tons.	Number.	Tons.
Dreadnaughts (modern)	22	548, 250	22	548. 250
Dreadnaughts (obsolete)	10	199. 600	3	64, 000
Pre-dreadnaughts	14	214, 900	[1] 9	[1] 142, 900
Battle cruisers (modern)	6	175, 400	6	175, 400
Battle cruisers (obsolete)	4	72, 100	2	37. 600
Cruisers (modern)	1	18. 600	1	18, 600
Cruisers (obsolete)	20	230. 300	17	196, 600
Light cruisers (modern)	67	321, 710	67	321, 710
Light cruisers (obsolete)	18	63, 660	12	39, 160
Flotilla leaders (modern)	28	48. 342	25	43, 524
Destroyers (modern)	344	366, 729	341	363, 739
Destroyers (obsolete)	43	31, 271	.....	.....

[1] All will probably be disposed of by 1923.

Strength of Japanese Navy in 1923.

	Number.	Tons.
Dreadnaughts (modern)	8	258, 860
Dreadnaughts (obsolete)	1	20, 800
Predreadnaughts	6	99, 562
Battle cruisers (modern)	6	190, 000
Battle cruisers (obselete)	.....	.....
Cruisers (modern)	.....	.....
Cruisers (obsolete)	6	65, 518
Light cruisers (modern)	25	133, 150
Light cruisers (obsolete)	3	10, 940
Destroyers (modern)	[1] 42	41, 665
Destroyers (obsolete)	14	8, 600

[1] There will probably be 32 other destroyers of 850 to 1,300 tons each.

Strength of French Navy in 1923.

Dreadnaughts (modern)	7	185, 531
Dreadnaughts (obsolete)	4	92, 380
Predreadnaughts	10	166, 039
Cruisers (obsolete)	5	67, 559
Light cruisers (modern)	6	31, 200
Destroyers (modern)	8	7, 416
Destroyers (obsolete)	25	17, 725

Strength of Italian Navy in 1923.

	Number.	Tons.
Dreadnaughts (modern)	4	123,600
Dreadnaughts (obsolete)	5	108,360
Predreadnaughts	4	49,700
Cruisers (obsolete)	4	38,362
Light cruisers (obsolete)	6	19,538
Flotilla leaders (modern)	14	22,217
Destroyers (modern)	9	8,285
Destroyers (obsolete)	36	23,221

Strength of United States in 1923.

Dreadnaughts (modern)	17	612,700
Dreadnaughts (obsolete)	12	276,650
Predreadnaughts	14	208,240
Cruisers (obsolete)	16	152,150
Battle cruisers (modern)	6	211,600
Light cruisers (modern)	10	71,000
Destroyers (modern)	309	369,028
Destroyers (obsolete)	21	15,582

Standing of navies in 1923, capital ships only.

[This includes only modern dreadnaughts and modern battle cruisers.]

United States	23	824,500
Great Britain	28	723,650
Japan	14	448,860
France	7	185,531
Italy	4	133,600

JAPANESE MEN-OF-WAR BUILT SINCE 1 JANUARY, 1919.

Source: Reliable.

(13139-A.)

5 August, 1920.

Ship.	Type.	Displacement.	Speed.	Built at—	Launched or completed.	Guns.	Torpedoes.
Nagato	Superdreadnaught.	33,800	23	Kure	Completed Mar., 1920.	8–16″ 22–5.7″	4–21″
Mutsu	....do	33,800	23	Yokosuka	Launched May, 1920.	8–16″ 22–5.7″	4–21″
Tosa	....do	40,600(?)	23	Mitsubishi	Laid down Feb., 1920.	8–16″ 22–5.7″	
Kiso	Light cruiser	5,500	33	....do	Launched June, 1920.	7–5.5″ 2 mach.	4
Tama	....do	5,500	33	....do	Launched Feb., 1920.	2 mach.	4
Kuma	....do	5,500	33	Sasebo	Launched July, 1919.	2 mach.	4

JAPANESE MEN-OF-WAR BUILT SINCE 1 JANUARY, 1919—Continued.

Ship	Type.	Displacement.	Speed.	Built at—	Launched or completed.	Guns.	Torpedoes.
Kitagami	Light cruiser	5,500	33	Sasebo	Launched July, 1920.	2 mach.	4
Oi	do	5,500	33	Kawasaki	do	2 mach.	4
Tenriu	do	3,500	33	Yokosuka	Completed 1919.	4–5.5″ 2 mach.	6
Tatsuta	do	3,500	33	Sasebo	Completed Mar., 1919.	2 mach.	6
Yakaze	First-class destroyer.	1,345	34	Mitsubishi	Completed July, 1920.	4–4.7″	6
Sawakaze	do	1,345	34	do	Launched Jan., 1919.	4–4.7″	6
Hakaze	do	1,345	34	do	Launched June, 1920.	4–4.7″	6
Akikaze	do	1,345	34	do	Building	4–4.7″	6
Yukaze	do	1,345	34	do	do	4–4.7″	6
Hokaze	do	1,345	34	do	do	4–4.7″	6
Shimakaze	do	1,345	34	Maidzuru	Launched Mar., 1920.	4–4.7″	6
Nadakaze	do	1,345	34	do	Launched June, 1920.	4–4.7″	6
Minekaze	do	1,345	34	do	Launched Feb., 1919.	4–4.7″	6
Okikaze	do	1,345	34	do	Building	4–4.7″	6
Shiokaze	do	1,345	34	do	do	4–4.7″	6
Tachikaze	do	1,345	34	do	do	4–4.7	6
Nire	Second-class destroyer.	835	39(?)	Kure	Completed Feb., 1920.	3–4.7″	4
Kuri	do	835	39(?)	do	Launched Mar., 1920.	3–4.7″	4
Kaya	do	835	39(?)	Yokosuka	Completed spring, 1920.	3–4.7″	4
Momi	do	835	39(?)	do	do	3–4.7″	4
Nashi	do	835	39(?)	Kawasaki	do	3–4.7″	4
Take	do	835	39(?)	do	Launched Aug., 1919.	3–4.7″	4
Hiku	do	835	39(?)	do	Building	3–4.7″	4
Fuji	do	835	39(?)	Fujinagata	Launched June, 1920.	3–4.7″	4
Kaki	do	835	39(?)	Uraga	Completed spring, 1920.	3–4.7″	4
Hagi	do	835	39(?)	do	Building	3–4.7″	4
Toga	do	835	39(?)	Ishikawajima	Launched Apr., 1920.	3–4.7″	4
Susuki	do	835	39(?)	do	Building	3–4.7″	4
Aoi	do	835	39(?)		do	3–4.7″	4

JOHNSTON RECORDING STAR GAUGE.

Source: Reliable.

(13521.)

20 August, 1920.

The accompanying sketch shows a type of recording star gauge invented by a former officer in one of the British ordnance factories. When drawn through the gun it makes very rapidly a continuous graphical record of the bore diameter at all points of the bore. The explanation of the operation of the device follows:

Dot and dash lines represent interior of bore. The whole instrument is drawn from right to left along length of bore.

A and B are gauge points. Inequalities cause these points to approach or recede from one another against action of spring C. This causes piston D to compress liquid in cylinder E which passes through Channel F and causes piston G to move. Pencil H attached thereto oscillates on drum K which is revolved to action of drum and gear L plotting a graph of the inequalities in bore.

Ratio area piston D to area piston G multiplies the inequalities to any desired extent depending on construction of instrument.

RANGEFINDERS.

Source: Reliable.

(13092.)

25 August, 1920.

It has been reported that the Japanese Government has since 15 May, 1920, placed orders with Barr & Stroud (Ltd.) totaling £60,000, and that a further order of £25,000 was anticipated. These range finders were mostly of the FQ type. This is evidently an indication of a policy to reequip with the most modern range finders all existing Japanese construction.

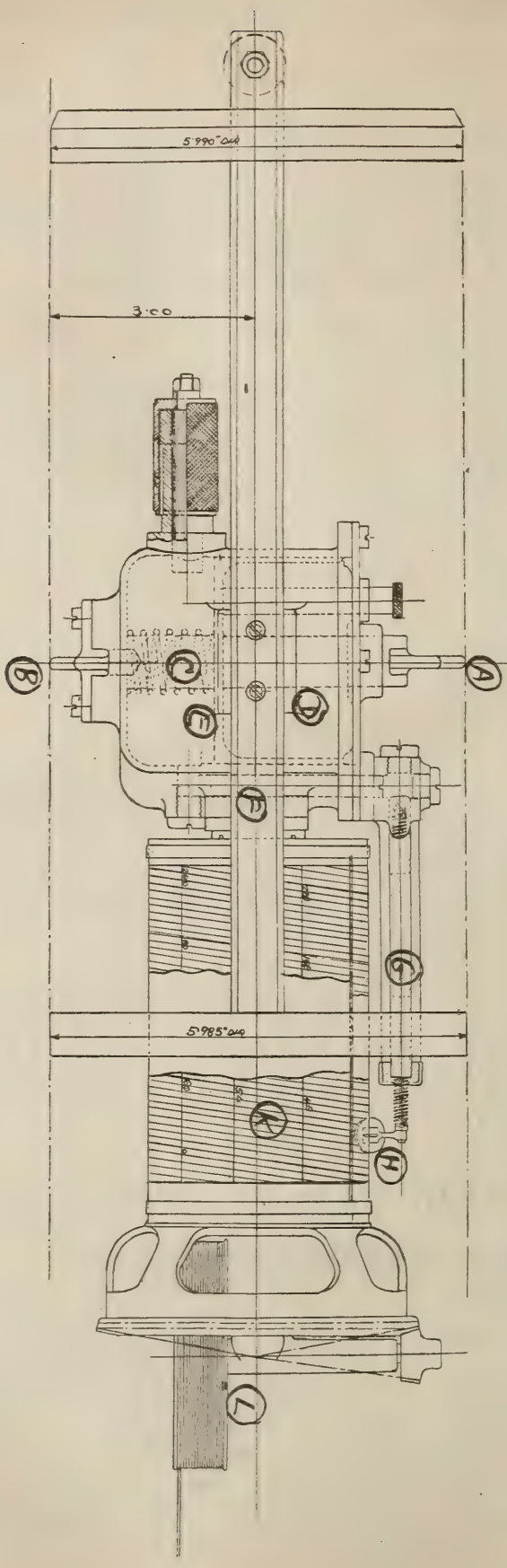
Barr & Stroud are still having a great deal of difficulty with the vacuum range finder. Joints and external openings like those necessary in fixing adjustable eyepieces are giving them the most trouble.

CASUALTIES DUE TO MILITARY AGENTS (Part 1).

Source: War Department (Office of the Surgeon General).

11 September, 1920.

During the World War there were 266,112 admissions to A. E. F. hospitals for injuries due to military agents. Of these agents, gas was the most potent cause of noneffectiveness, although the percentage of deaths from gas was comparatively small. Of the 88,980 gas cases, 38,396, or 43 per cent, are known to have been caused by mustard gas. There were 39,914 gas cases in which the kind of gas involved was not specified in the records.


5·990"dia
3·00
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A
B
C
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G
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K
L

A satisfactory comparison of the agents listed below is not possible from this classification, since the term "gunshot missile" was somewhat generously used to include wounds of uncertain origin.

Agents.	Number of admissions.	Per cent of total.
Gas (all kinds)	88,980	33.4
Gunshot missile, unclassified	85,132	32.0
Shrapnel	40,448	15.2
Rifle ball	22,536	8.5
Shell	21,312	8.0
Hand grenade	1,156	.4
Indirect result military agent	1,333	.5
Explosives	946	.3
Pistol ball	257	.1
Bayonet	245	.1
Falling objects	193	.1
Aerial bomb	150	.1
Cutting and piercing instrument	146	.1
Aeroplane	88	.....
Crushing	85	.....
Saber	14	.....
Other	3,091	1.2
Total	266,112	.....

CASUALTIES DUE TO MILITARY AGENTS (Part 2).

Source: War Department (Office of the Surgeon General).

During the World War there were 266,112 admissions to the A. E. F. hospitals for wounds due to military agents. A classification of these made by the Surgeon General's Office shows, in general, the relative vulnerability of the parts of the body of a soldier in combat. It must be remembered, however, that the frequency of wounds in any part of the body is dependent to a considerable extent upon the nature of the warfare. In this tabulation all casualties from gas, excepting those from mustard gas, are classified under "thorax." Additional material on this subject will appear in the Surgeon General's annual report for 1920.

Location of wounds.	Number of admissions.	Per cent of total.
Legs	72,527	27.2
Thorax [1]	67,584	25.4
Arms	56,213	21.1
Head [2]	35,819	13.5
Abdomen or pelvis	10,286	3.9
Back [3]	8,948	3.4
Neck	5,896	2.2
Unclassified	8,839	3.3
Total	266,122	.....

[1] Includes 50,084 gas cases. [2] Includes 24,251 facial injuries. [3] Includes 879 spinal injuries.

ITALIAN DESTROYER RACCHIA, LOSS OF.

Source: Reliable.

(10707.)

23 August, 1920.

In the latter part of July the Italian destroyer *Racchia*, sometimes known as a scout cruiser, while leading a convoy in the Black Sea struck a mine and sank in 20 minutes.

The *Racchia* was an *Ansaldo* boat of 1,540 tons displacement.

She is regarded as a total loss.

About 7 men lost their lives in the explosion.

NEW JAPANESE WARSHIPS TO BE BUILT BY KAWASAKI DOCKYARD.

Source: Reliable.

(9324.)

5 August, 1920.

It has been reported that the following orders have been placed by the navy department with Kawasaki dockyard for vessels to be completed within the next two years: 9 submarines, 1 battle cruiser, 2 destroyers, 2 transports.

EX-GERMAN SCOUT CRUISERS FOR ITALIAN NAVY.

Source: Reliable.

(12474.)

4 August, 1920.

The Italian minister of marine advises this office under date of August 1 that the ex-German scouts *Grandenz* and *V. 116*, ceded to Italy under the terms of the interallied convention, have been entered in the Italian war marine under the respective names *Ancona* and *Premuda*.

GARRISON AT TSUSHIMA ABOLISHED.

Source: Reliable.

(13557.)

19 August, 1920.

The Tsushima garrison was abolished on August 10, as it was decided by the military authorities that the original purpose for which the garrison had been established no longer existed. When the garrison was first placed on this island communication between it and the mainland of Japan was irregular and slow. Tsushima was an important outpost toward Asia.

The improvement of the science of communication has reached such a point that an outpost garrison is no longer necessary. With the abolition of the garrison the term of military service for the

people of the island will be put on the same basis as that of the rest of the country, namely, two years' service instead of one.

The Jiji states that the offices of general garrison headquarters was abolished at the same time, the work being taken over by the head of the first division.

AUSTRALIA WOULD BAR JAPANESE SEAMEN.

Source: Reliable.

(12669.)

19 August, 1920.

A Sydney dispatch states that the union of Australian seamen has passed a resolution opposing the employment of Japanese sailors on vessels engaged in the coastal trade of Australia and in Australian waters. The union further insists on the discharge of Japanese now employed on vessels in that trade and the filling of their places by the Australian seamen who are out of employment.

BATTLESHIPS "NAGATO" AND "MUTSU."

Source: Reliable.

(6797.)

19 August, 1920.

The following data is furnished on the battleships *Nagato* and the *Mutsu:*

Length	660 feet 7 inches.
Beam	95 feet.
Draft	30 feet.
Displacement	33,800 tons.
Speed	23 knots.
Complement	1,336.
Number of boats	12.
Place where built	Kure Navy Yard.
Date of launching:	
Nagato	Nov. 9, 1919.
Mutsu	May 31, 1920.
Armament	8 16-inch guns, 20 5.5-inch guns, 8 torpedo tubes (21 inches) (4 double-barreled under-water tubes).
Searchlights	10.
Engines	4 turbines.
Boilers	21 Japanese navy department type.
Propellers	4.

LIABILITY OF ENGINES TO CATCH FIRE AT THE CARBURETER.

(13541.)

Source: British. **July, 1919.**

This report contains the results of tests on an engine coupled to a Heenan and Froude water brake.

(1) Each carbureter was arranged to have a separate petrol supply with a cock in each circuit, so that the supply could be regulated. The engine was run up to full throttle and the petrol supply cut down until popping back occurred, but it was impossible to make the carbureters catch fire.

(2) An inlet valve tappet was adjusted so that the valve never closed, and it was found necessary to make approximately one-sixteenth-inch clearance between the valve and its setting, anything less having no effect whatever on the liability to back fire in the induction pipe. At full throttle only very slight popping back occurred, but when the throttle was half closed the carbureters caught fire.

(3) With the engine throttled down and the altitude control fully open, it was impossible to open up the throttle, as the engine cut out completely, but the altitude control can be opened after the throttle has been fully opened, and when the throttle is then slightly closed popping back occurs, but no fire.

(4) A leak was made in the induction pipe by taking out a 1-inch brass plug while the engine was running on full throttle; this resulting in a drop of about 200 R. P. M., and to obtain popping back the throttle had to be closed a little, but it was impossible to obtain a fire.

(5) It would appear from these tests that half-throttle position was the worst, as regards popping back, on the type of carbureter tested, but it should be noted that whatever condition may arise these tests seem to indicate that fire does not take place unless the interior of the air intake or body of the machine is conducive to fire; that is to say, unless petrol or other inflammable material is in the vicinity. This, however, is perfectly possible with a flooding carbureter, unless the air intakes are a throughly good job, with petrol-tight joints, not liable to break down due to vibration, and are taken well outside the machine.

(6) The connection between the induction pipe on the two blocks of cylinders was blanked up, and the float of one carbureter was weighted so as to cause flooding. An inlet valve was held wide open

on the block of cylinders which the flooding carbureter was supplying. Both carbureters were fitted with standard air intakes. The engine was then run, but no fire occurred, although the inlet valve was open and quantities of petrol were being blown down the air intake. It was definitely confirmed that the cylinder was firing while the inlet valve was held open and that explosions occurred in the induction pipe, but no flame reached the mouth of the air intake.

From this it would appear that if a fire actually occurs in the induction pipe itself the suction of the other cylinders is sufficient to prevent the fire from reaching the mouth of the air intake.

(7) Under the same conditions as above, only with an exhaust valve lifted instead of an inlet valve, the engine was again run, but no fire or popping back occurred.

(8) From the results of the tests carried out it was found that the only way to produce violent popping back in the carbureters was to starve them of petrol (such as would be caused by sudden breakage of a petrol pipe); even then a fire did not occur unless petrol-soaked rag or like inflammable material was placed in the vicinity of the air intake. The petrol cock was turned nearly off, when violent popping back occurred, setting the rag on fire.

It is pointed out that it is possible for a petrol pipe to break, introducing large volumes of petrol into the inside of the cowling, and if at the same time popping back occurs, which is probable, due to this or any other cause, a serious fire may originate. This emphasizes the necessity for always fitting air intakes which project well outside the cowling.

(9) An attempt was made to take the pressure in the induction pipe at the moment popping back occurs, by means of weights acting on the principle of dead-weight safety valves, but was unsuccessful owing to the vibration of the engine making it impossible to retain the pegs in position.

Summary.—Further experiments were carried out on the liability of engines to catch fire. These experiments have been conducted on two different types of engine by another make, and it was a matter of extreme difficulty to cause either to catch fire.

Tests on Engine No. 1.

(1) Various tests were carried out on this engine, but it is desired to point out that the engine itself is not of the latest type, the main difference being in the arrangement of the carburetter and air intakes. In it the air intakes from the carburetter face downward onto the top of the crank case, whereas in a later type they are turned upward and gauze covered in a similar manner to engine No. 2. This very fact would preclude to a large extent the possibility of a fire in the later types.

(2) The first test consisted of adjusting an inlet valve tappet in such a manner that the valve never closed. The engine was started, and when running at full throttle a continuous series of small back fires resulted, which, however, never reached the mouth of the air intake, and although petrol was placed in this vicinity, no fire resulted.

(3) With the engine running on full throttle, the altitude control was then opened; this caused back fires to the same extent as that described in paragraph 2, but if the control was opened too far the engine was stopped entirely. Under these conditions also no fire was obtained.

(4) With the engine running on full throttle, an air leak was caused in one induction manifold, but again, this had no effect whatever beyond causing a continuous series of small back fires.

(5) Finally the mixture was weakened by nearly stopping the supply of petrol to the carburetter. This caused rather larger back fires, and when a petrol-soaked rag was placed on the top of the crank case in the vicinity of the intakes a fire resulted.

Tests on Engine No. 2.

(6) The tests outlined in paragraphs 2, 3, and 4 were now repeated on the second engine with precisely similar results.

(7) An additional test was carried out where the carburetter was caused to flood by weighting the float. Back fires were then caused by restricting the flow of petrol to the carburetter. This caused a number of back fires, but the flow of petrol through the carburetter was such that it quickly made up for the lack of petrol in the mixture and went to the other extremity, making the mixture too rich, so that it refused to fire in the cylinder but burnt as a long flame from the exhaust pipes, it being set on fire by that exhaust immediately behind the cylinder from which the mixture was being pumped. However, even under these conditions no fire was obtained.

(8) Finally the mixture was weakened by restricting the flow to the carburetters, these, of course, now being in a normal condition, and it was found that powerful back fires occurred every minute or so, when the flame actually reached the gauze with which the intakes are fitted. With the engine running under these conditions a petrol-soaked rag was brought into proximity with the gauze and a fire occurred. This was repeated twice.

(9) This latter test was carried out in an endeavor to duplicate the remote possibility of the petrol supply pipe to the carburetter breaking at a point where the petrol would tend to spray direct onto the air intake. Should this occur, it would have the effect of weakening the mixture and making the conditions absolutely right for a fire inside the cowl of the machine. It is, of course, a very remote

possibility that the pipe should break in absolutely the right place, but the test was carried out with a view to determine what would be the effect under the most adverse conditions possible to obtain.

(10) The conclusions which may be drawn from these tests may be summarized as follows:

(*a*) Fire will not occur on any engine unless the conditions in proximity to the air intakes are suitable; that is to say, unless petrol, petrol vapor, or any other inflammable material is in such a position that it can be quickly ignited. It is to be noted, however, that the conditions under which petrol vapor might be present, e. g., a broken petrol pipe, are exactly those which cause bad firing back through the carburetter.

(*b*) Any engine can be caused to back fire by various things which may happen in flight, as, for instance, the breakage of an inlet valve spring, breakage of the petrol feed pipe, or a fracture of the induction manifold. These conditions produce the necessary cause for a fire, but if the air intakes are carried well outside the cowling there should be very little probability of a fire starting inside the cowling of the machine.

(11) It is desired to point out that the latest type of engine by this maker is, as it stands, exceedingly difficult to set on fire, but the same remarks regarding the position of the air intake relative to the cowling apply equally as well.

Tests on Magnetos Immersed in Explosive Mixtures of Petrol and Air.

Summary.—The report describes tests in which various magnetos were run in explosive mixtures of petrol vapor and air. Magnetos of types 1–4 were satisfactory. Magnetos types 5 and 6 were unsatisfactory.

The general conclusions to be drawn from the tests is that attention should be paid to the mechanical details, so that the magnetos are made as nearly gas-tight as possible.

The tests described in this report were made at the request of the fire-prevention subcommittee.

The fire test of each magneto was made by running the machine on open circuit in a cylinder containing an explosive mixture of petrol and air, the magneto being driven from outside the cylinder. The cylinder was fitted with a pressure gauge, vacuum gauge, a horizontal tube filled with wire gauze for a carbureter, and connections to an exhaust pump and to a small air compressor. In order to produce an explosive mixture, the cylinder was exhausted to about one-half atmospheric pressure, the requisite quantity of petrol measured into the carbureter, and the partial vacuum used to draw the petrol into the cylinder. The final pressure in the cylinder was atmospheric. A test sparking plug actuated by a small external

magneto was fitted to the cylinder, so that the mixture could be exploded independently of the magneto under test. It was found advantageous to raise the temperature of the cylinder and carbureter a few degrees above atmospheric temperature in order to obtain good explosive mixtures. The pressure gauge registered about 100 pounds per square inch, when an explosion occurred inside the cylinder.

In testing the magneto in the explosive mixture it was started and stopped several times, and then allowed to run at 2,000 revolutions per minute for five minutes. If this did not fire the mixture the behavior of the magneto was considered to be satisfactory. All such tests in which the mixture did not fire immediately with the test sparking plug were discarded. The above procedure was followed in tests of all magnetos which are quoted in the report as not exploding the mixture.

Results of Tests.

(1) *Magneto, type No. 1.*—In the first test the magneto ignited the mixture when run up to a speed of 1,600 revolutions per minute. On examination, the only possible source of trouble appeared to be at the contact breaker. The cover over the contact breaker was a loose fit, and on running the magneto in the dark on open circuit a small (almost continuous) spark was seen at the make and break, and also on occasional spark from the contact breaker to the frame of the magneto. It was assumed that in the first test the loose fit of the cover allowed the explosive mixture to reach these sparks, which then ignited the whole mixture in the cylinder. The cover was made a better fit with a strip of brown paper, and the magneto again tested in the explosive mixture. No explosion was obtained. A further test was made in which the magneto was immersed in the mixture for one hour and then tested in the usual manner. No explosion was obtained. Examination of the magneto when running normally with a sparking plug showed that the sparking at the make and break was much less pronounced than when running on open circuit and that no sparks passed to the frame of the machine.

This type of magneto should be quite safe if the cover over the contact breaker be made a good fit.

(2) *Magneto, type No. 2.*—No spark could be obtained from this magneto in the condition in which it was received, but on examination it was found that the spring clip holding the rocker arm in position had slipped out of place and was short-circuiting the machine. This was remedied and a good spark obtained. The magneto was tested three times in explosive mixtures, and no explosion was obtained. In the third test is was immersed in the mixture for one hour before the test was made.

This type of magneto appears to be quite safe.

(3) *Magneto, type No. 3.*—In the first test the magneto did not fire the explosive mixture in which it was immersed, but the wire gauze in the ventilating holes in the distributor was blown away by the force of the explosion when the mixture was fired with the test sparking plug. The wire gauze was replaced by the fine brass gauze B, and the magneto again tested in the mixture. No explosion was obtained at first, but after immersion in the mixture for a few minutes an explosion was obtained. This seemed to require investigation, since in the first test the magneto was satisfactory. Accordingly, the cover over the contact breaker was made a better fit than before, the ventilating holes blanked with leather disks, and a further test made. No explosion was obtained. Two tests were then made with the copper gauze A fitted in the ventilating holes, the second test being made after immersion in the explosive mixture for one hour. No explosions were obtained in these two tests. A further test was made with the wire gauze C fitted in the ventilating holes, and an explosion was obtained almost immediately.

This type of magneto appears to be safe when the copper gauze A is fitted to the ventilating holes, but apparently the action of different kinds of wire gauze requires investigation. It should be noted that in this type of magneto the safety cap is not at the distributor.

Details of wire gauze.

Reference.	Material.	Thickness of wire.	Mesh.
		Inch.	*Inch.*
A	Copper	0.006	0.019
B	Brass	.004	.011
C	Copper	.007	.024

(4) *Magneto, type No. 5.*—In the first test the magneto fired the mixture immediately, and on examination it was found that the wire gauze in the ventilating hole had been blown away. This was replaced with gauze A and the magneto retested. The mixture was exploded immediately. Gauze B was fitted in the ventilating hole and the magneto again tested and found to fire the mixture.

The ventilating hole was then blanked with a leather disc, and on testing the magneto in this condition no explosion was obtained. From these tests it appears that the explosive mixture penetrated into the magneto through the gauze in the ventilating hole, and that an explosion occurred inside the distributor of sufficient magnitude for the flame to pass through the wire gauze and ignite the mixture surrounding the magneto.

To investigate this possibility, a small tube 3 inches long and $\frac{3}{4}$ inch diameter was covered with wire gauze A at one end and a sparking

plug fitted at the other end. This was fitted inside one end of the test cylinder and an explosive mixture produced. Time was allowed for the mixture to penetrate into the tube, but no explosion was obtained by vigorous sparking at the covered plug. The mixture fired immediately with the test sparking plug in the cylinder. A further test was made with a gun-metal cylinder $2\frac{3}{4}$ inches diameter and 3 inches long, fitted with wire gauze in a $\frac{3}{4}$-inch diameter hole at one end and a sparking plug at the other end. This was similarly attached inside the large cylinder used in the magneto tests and an explosive mixture produced. Sparking at the plug in the gun-metal cylinder caused an explosion of the mixture in the large cylinder, and on examination the gauze, which blocked the only means of communication between the two cylinders, was found to be intact. Explosions were also produced in the gun-metal cylinder when it was not inclosed in the test cylinder, and in each case the flame of the explosion was seen to pass through the end hole of the cylinder without the gauze exerting a retarding effect or being injured by the flame. Apparently this occurred inside the test cylinder, and the flame that passed through the gauze ignited the whole mixture.

It is suggested that a similar action could occur in a magneto with a fairly large space around the safety gap. An attempt was made to verify this on the No. 5 magneto by fitting a small tube in the ventilating hole with gauze at each end and baffle plates in the middle, so that a flame could not pass directly through the tube. The magneto was tested in an explosive mixture with this tube in the ventilating hole and an explosion occurred immediately. Examination showed that it was unlikely that the explosion had started inside the distributor, and on running the magneto on open circuit in the dark it was seen that the insulation of one of the high-tension terminals had broken down and that sparks were passing to the frame of the machine. (Fig. 2.) Further examination showed that this sparking from the terminal did not occur when the magneto was run with plugs attached.

This magneto ignited the mixture in all the tests, with the exception of the test in which the ventilating hole was blanked with leather, and seems to require further attention.

(5) *Magneto, type No. 4.*—In the first test the magneto fired the explosive mixture immediately. The machine was then run in the dark on open circuit, and a small spark occurred occasionally from one high-tension lead connection to the frame. This spark was probably due to moisture or dirt, as after the insulation was cleaned no sparks were observed. Two further tests were made on the magneto in explosive mixtures, the second test after immersion in the mixture for one hour, and no explosions were obtained.

(6) *Magneto, type No. 3.*—This magneto was fitted with an aluminium cover plate over the high-tension distributor, and a thin jointing material was provided between this cover plate and the distributor. Test in explosive mixtures showed that this joint was not tight enough to prevent an explosive mixture from leaking into the magneto, becoming ignited at the safety gap and then firing the mixture in which the magneto was immersed. Thin leather was then used in place of the original joining material, but the magneto again fired the mixture when tested. The design of the aliminium cover over the contact breaker allowed the mixture to penetrate around the make and break at the platinum points. This was prevented by fitting a small brass sleeve, and the ventilating holes were also blanked with leather discs. Two further fire tests were then made with these modifications, and in the second test the magneto was immersed in the mixture for one hour. No explosions were obtained. The leather discs in the ventilating holes were replaced with wire gauze A and the magneto again tested. After starting and stopping several times, the magneto fired the mixture, and it is suggested that this was a similar case to the ignition through the wire gauze in the No. 5 magneto.

After an interval of several days further tests were made on the magneto, and it was found that it fired the mixtures by means of sparks passing from the high-tension terminals to the aluminium cover plate. This did not occur in the previous tests.

This type of magneto appears to require further attention.

At the conclusion of the tests the magnetos were run with plugs attached, and all were found to give satisfactory sparks. It is worthy of notice that in all the tests no apparent trouble was experienced with the drain holes in the magneto.

The test cylinder was also used to produce explosions at pressures below atmospheric, and no difficulty was experienced in obtaining and firing mixtures at 5 inches and 10 inches of mercury below atmospheric pressure.

Preliminary Report on Experiments on the Extinguishing of Petrol Fires on a Derelict Aeroplane.

The following is a brief account of some experiments which have been carried out with the object of obtaining an efficient means of extinguishing petrol fires on an aeroplane.

The fire-extinguishing liquids which have been tried include carbon tetrachloride, tetrachlorethane, liquid sulphur dioxide and foamite. Of these, carbon tetrachloride was found to be the most suitable, and only the tests made with this extinguisher are herein described.

The machine used was an old fuselage with a vee-type of engine. During the tests the machine was placed head on in a slipstream of about 60 M. P. H. provided by another machine. Petrol from an outside tank was allowed to flow into the vee of the engine at a point immediately behind the carburetter. This point was chosen as being the most likely place where a leak would occur due to carburetter flooding or breaking of the petrol-resisting joint. The flow of petrol was such that the entire engine, the bearers, the underside of the crank case, and the floor fairing were liberally covered with petrol. Before commencing each test the engine and surrounding parts were also well smeared with oil. Figure 6 shows the arrangements for the experiments.

The carbon tetrachloride was distributed under pressure (produced by a CO_2 capsule) through small brass rose sprays and perforated copper tubes, experiments being conducted to determine the most suitable form and most convenient positions of the distributors. The charge was contained in a brass cylinder of about 10 pints capacity, and was forced out under an initial pressure of 170 pounds per square inch by depressing a plunger operated from the pilot's seat.

After fixing the installation in the machine the petrol was turned on, ignited, and the slipstream started. The fire was allowed to burn some time and the extinguisher was then brought into operation. If the fire was not extinguished the arrangement was modified by altering the distributors or introducing others, until success was obtained. In this way fires of increasing size were dealt with, and difficulties introduced by varying the position of the machine were overcome, and it was possible to extinguish fires such as would occur if the main petrol supply pipe were completely severed.

The best results were obtained when the whole of the carbon tetrachloride was liberated in a small space of time through a very large number of fine jets which sprayed practically the whole of the burning surfaces. A good delivery of the extinguisher at the point of issue of the petrol, so as to mix with the petrol and render it less inflammable, also assisted the extinguishing operation.

The problem would be somewhat simplified if the rubber leads were covered with flexible metal tubing and the wood fireproofed, as these parts tended to burn after the petrol fire had been extinguished. The following table shows some of the results obtained:

Series.	Rate of petrol leak per minute.	Altitude attitude of machine.	Time of burning before extinguisher was operated.	Time required to extinguish.	Number of distributors.	Amount of carbon tetrachloride used.	Condition of radiator.	Remarks.
	Pints.			*Seconds.*		*Pints.*		
1	¾	Normal flight.	5	6	5	4	Closed....	
2	2½	...do.....	10	5	6	6	...do.....	
3	2½	...do.....	20	10	7	8	Open.....	1 gallon of carbon tetrachloride was delivered in 12 seconds.
	2½	Climbing at 12°.	10	10	7	8	...do.....	
	2½	Diving at 12°.	10	3	7	4	...do.....	
4	6.7	Normal flight.	10	10	7	8	...do.....	1 gallon of carbon tetrachloride was delivered in 7 seconds.
	6.7	Climbing at 12°.	10	10	7	8	...do.....	
	6.7	Diving at 12°.	10	8	7	8	...do.....	
5	6.7	Normal flight.	6	5	7	8	...do.....	Burning in practically still air.

The installation used in series 3 and 4 was capable of dealing with fires in any ordinary flying altitude of the machine.

The petrol flow in series 4 was the maximum normally possible, i. e., the flow from a completely severed petrol lead when the pressure in tank is 2½ pounds per square inch.

In series 1 the flames were not readily detected from the pilot's seat, but in series 2 and 3 they were easily visible after a few seconds burning, and in series 4 they extended quickly for 3 or 4 feet behind the engine on either side and for about 8 feet underneath.

In this latter series much of the burning petrol runs through the bottom of the fairing, so that flames are blown back underneath the fuselage and there is danger of the floor of the cockpit catching fire if the petrol fire is not extinguished fairly quickly.

In no case would the pilot be seriously inconvenienced by the fumes from the carbon tetrachloride, and in the above fires there was ample time after the fire was seen to turn off the petrol and operate the extinguisher before the situation became uncomfortable.

As might be expected, the easiest fires to deal with were those which took place when the machine was in a diving attitude, since in this case much of the burning petrol runs away over the front of the crank case and the burning area is smaller than in other positions, while the cooling effect of the slipstream is greatest.

Experiments Carried Out Before the Fire Prevention Subcommittee of the Advisory Committee on the Aerodrome, Farnborough, July 23, 1919—Demonstration on Relative Effects of Carbon Tetrachloride Extinguishers and Foam Extinguisher on Petrol Burning in an Open Dish.

1. An iron tray 2 feet square and 4 inches deep was used. The extinguishing liquids were distributed over the surface of the burning petrol by means of a 5-inch rose, supported about 9 inches above the surface of the petrol. In all cases two pints of petrol were used, the extinguishers being brought into play immediately after igniting the petrol.

2. *Carbon tetrachloride in still air.*—The first attempt failed to extinguish the fire owing to an obstruction in the valve of the extinguisher.

This was remedied and the experiment repeated. The fire was extinguished almost immediately, about a quarter of a pint of carbon tetrachloride being used.

The mixture remaining in the tray was found to be inflammable.

3. *Carbon tetrachloride in wind of about 40 M. P. H.*—The rose was lowered to about 5 inches above the surface of the liquid, and placed to windward of the center of the tray. Experiment 1 was repeated, using a fresh supply of petrol, and turning on the wind as soon as the petrol was ignited. The fire was extinguished in a few seconds, about one pint of carbon tetrachloride being used.

4. *"Foam" in still air.*—A 3-pint charge was first used. This did not completely cover the surface of the burning petrol, and the fire was not extinguished.

The experiment was repeated using a 14-pint charge. When the foam had completely covered the surface to a depth of about 2 inches it was turned off. The fire had been greatly damped down, but was still burning, the petrol boiling and the bubbles of vapor burning on the surface of the foam. On adding more foam, to a depth of about 3 inches, the fire was gradually extinguished.

5. *Pyrene hand extinguishers.*—Two extinguishers were used. The flames were considerably reduced, but the petrol continued to burn for about one and one-half minutes and was still burning when the extinguishers had become practically exhausted.

6. *"Acid-carbonate" extinguisher.*—Two-gallon charge. This did not extinguish, the petrol burning on the surface of the water.

7. *Water.*—A bucket of water poured into the tray failed to extingush the fire. When the water was dashed violently into the fire it scattered the petrol without extinguishing it.

8. *Attempt to extinguish by foam extinguisher a derelict machine (artificially fired) burning in a slip stream.*—A wrecked engine was

mounted in a scrap fuselage, and was cowled, the radiator being partly covered with fabric so as to represent the partly closed shutter condition.

A continuous stream of petrol was fed through a $\frac{1}{4}$-inch copper pipe into the vee of the engine just behind the carburetter. The slip stream (about 50 M. P. H.) was provided by another machine placed in front.

Foam distributors were used, one rose being fixed just behind the carburetter, delivering downward, another rose delivering horizontally, against the slip stream, from the rear of the engine below the middle of the crank case; the third (a "Niagara" sprinkler) being placed symmetrically with the second. Each distributor was connected by a $\frac{3}{4}$-inch petrol hose with a 14-pint foam apparatus.

The petrol was turned on and ignited. The propeller was then started and the extinguishers brought into operation. The effect of the foam was to extinguish the fire in the vee and on the upper side of the crank case, but the petrol burned on the lower side of the crank case and on the fairing below. The slits (about 2 inches wide) in this fairing allowed the foam to fall through and blow away. The fire continued to burn as long as petrol was supplied.

9. *Spread of fire on fabric of wings.*—A wing was ignited in a slip stream to show that the fire does not spread where the slip stream can take effect, but where baffled in any way the doped fabric burns readily.

Part of a wing (doped with acetyl dope and covered on the upper surface with P. C. 10 and on the lower with V. 114) was supported horizontally in the slip stream of a propeller, the wind, of about 40 M. P. H., blowing across the plane as in flight.

Petrol was poured on the upper surface and ignited. The flame of the petrol was blown out almost immediately without much damage being done to the wing.

This was repeated, allowing the petrol to burn in still air, so that the fabric had got well alight before it was subjected to the slip stream. The flame was quickly extinguished, but on stopping the propeller smoke was seen to be rising from the fabric, showing that combustion was proceeding inside. This was allowed to go in until flames issued from the wing, and the propeller was then started. The fire was extinguished in a few seconds, only that part of fabric which was shielded from the draft burning. Smoldering around the burned edges continued for about half a minute after stopping the wind.

10. A considerable quantity of petrol was then poured between the top and bottom covering of the damaged plane and ignited, and the propeller was started. The flames were soon extinguished after a portion of the fabric, which was evidently shielded from draft by the framework, had burnt.

11. *Difficulty of extinguishing fire after a crash.*—This experiment was intended to illustrate the effect of extinguishers on an irregular object covered with burning petrol on the ground to show how difficult it is to extinguish a fire after a crash.

A wrecked engine was laid on the ground and a pint of petrol poured over it. After the petrol was ignited 1 gallon of foam-producing solutions was poured over it from a "double bucket." This damped down but did not extinguish the fire.

12. After washing off the foam the experiment was repeated with the modification that the foam (from a 14-pint apparatus) was directed over the engine from the rose. The fire was gradually extinguished, the engine being completely covered with foam, which stuck well to the surface and showed no tendency to run off. About three-quarters of the charge was used.

13. The engine was again washed and the experiment repeated, using a 2-gallon "acid carbonate" extinguisher. The fire was not extinguished, but burned itself out shortly after the charge was exhausted.

Note.

1. The carbon tetrachloride was delivered from steel cylinders, each of about 1 gallon capacity and containing 6 pints of carbon tetrachloride; each had been subsequently charged with carbon dioxide to a pressure of about 100 pounds per square inch.

2. The foam was delivered from generators, in which the two foam-producing solutions—aluminium sulphate and sodium bicarbonate saponin—were mixed by the inverting of the container. The foam was ejected by the pressure of the gas produced during the reaction.

AIRSHIP METAL.

Source: Reliable.

17 June, 1920.

Duralumin.

Much has been done in investigating and improving the properties of duralumin as a material of construction since the days of *No. 1*. A variety of analyses are given below, culled from different sources. A sample taken from material supplied for *No. 9*, as analyzed by the admiralty chemist, gave:

Al	94.09
Cu	3.93
Mg	.66
Mn	.53
Si	.49
Fe	.30
	100.00

Another analysis gave:

Al	93.46
Cu	4.17
Mg	.58
Mn	.56
Si	.62
Fe	.35
Sn and Ni	.26
	100.00

No trace of P or Pb.

And one by N. P. L. gave:

Al	93.94
Cu	4.17
Mn	.56
Si	.62
Fe	.35
Zn and Ni	.36
	100.00

An analysis of the German alloy supplied for *No. 1* gave:

Al	93.75
Cu	3.94
Mg	.64
Mn	.56
Si	.70
Fe	.41
	100.00

From these a fair average composition can be gauged. For instance, a French analysis of material taken from the wrecked German Zeppelin *L2.77*, brought down at Revigny, gave:

Al	90.27 and	88.88
Zn	7.80	9.10
Cu	.73	.70
Fe	.45	.43
Si	.37	.49
Mn	.27	.25
Sn	.11	.15
Ni	Trace.	Trace.
	100.00	100.00

Note the substitution of Zn for a certain quantity of Cu and Al. The general properties of duralumin may be summarized as follows:

Weight	1.623 ounces per cubic inch.
i. e	0.102 pounds per cubic inch.
or	175.3 pounds per cubic foot.
Specific gravity	2.79.
Melting point	650° C.
Annealing point	350°–380° C.
Specific heat	214 (water unity).
Thermal conductivity	31 (silver 100).
Coefficient of linear expansion	0.0000226.

As regards its strength, the material can be supplied ranging from 25 tons per square inch U. T. S. with an elongation of 25 per cent to 35 tons per square inch with a small elongation of about 5 per cent. That used for angles and channels generally gave 25 tons per square inch in U. T. S. with 25 to 28 per cent elongation.

Young's Modulus (E) for duralumin can be taken as 4,700 tons per square inch, or 10.65×106 pounds per square inch, against 29×106 for mild steel. Experiments on various sections have given results varying from 4,350 to 5,000 tons per square inch and further experiments are being carried out at the time of writing.

It is interesting to note, assuming compressive strength to vary as the product of the modulus and sectional area, that for approximately the same weight steel and duralumin are similar; e. g.:

$10.65 \times 106 \times A = 29 \times 10^6 \times a$ for same strength and for same weight.

$\frac{A}{a} = \frac{29}{10.65} = 2.7$, and we know $\frac{\text{spec. grav. steel.}}{\text{spec. grav. durm.}} = \frac{7.8}{2.17}$.

However, one is precluded from working in steel for ships of the size at present building because the sectional area being 2.7 times less than that of the corresponing duralumin, constructional difficulties enter into the question.

All types and section of material can now be made of duralumin, ranging from sheet, angles, tubes, to screws and rivets, and all forms of castings and forgings. It lends itself to excellent press and stamp work, as shown in the many and intricate pressings utilized in *No. 9* framework.

It will be of interest to refer here to the special heat treatment recommended by the manufacturers and found to be so necessary for successful work.

The heat properties of duralumin are not developed until such of it as has been worked in any way has received this heat treatment. This final heat treatment consists of immersion of the metal in a bath of molten salts, comprising equal parts of potassium and sodium nitrates, maintained at a temperature of about 500° C. (Armstrongs used two-thirds potassium and one-third sodium.) After becoming uniformly heated the metal is withdrawn and quenched in cold water. If the article should be disturbed or require straightening it must be worked on within an hour after the quenching, because after that time has elapsed it will become too hard. If the working is then unfinished it should be reheat treated.

Before any working such as pressing or forging the duralumin should be heat treated, and also between each and every operation in a multipressing. The temperature in these cases need only be about

350° C., but the specimen or specimens should be quenched in cold water as before. Even after the half hour the annealed material commences to harden. This is, of course, especially noticeable in riveting, the rivets being reheat treated, if unused, every 45 minutes. After about 4 days the duralumin has regained, for all practical purposes, its normal hardness and strength.

Steel can readily be used in contact with duralumin as little or no electroytic is noticeable, but copper and brass are strongly electronegative to duralumin and should therefore never be used in contact with it where subject to moisture.

Extensive experiments of all kinds have recently been and are being carried out to get more information as regards the effect of previous treatment on the strength of duralumin.

Working Duralumin.

Duralumin in the final treated, finished condition, is too hard to work satisfactorily in the cold condition.

Whenever any cold work is required to be put on the material it must be done when in the annealed condition.

Annealing.

Annealing is performed by raising to a temperature of about 350° C., and then quenching the material in cold water.

The best means of heating the material uniformly and satisfactorily is by means of a salt bath consisting of an iron or steel trough partly filled with a saturated solution of potassium and sodium nitrates, heated externally by gas flames.

Accurate thermometers or pyrometers should be inserted in the sale mixture in order to show that the temperature is between the limits given and preferably at 350° C.

The articles are placed and left in the salt bath until they are uniformly heated to the same temperature.

It is vital that the temperature should not be allowed to go outside the limits in order that satisfactory results may be obtained.

In the case of complicated pressings which require several operations in the manufacture, annealing should be performed between each operation that requires working of the material. Small thin parts that only require working of a simple bending nature can usually be worked in the finished condition without annealing.

The work should be put on the annealed parts within an hour of annealing, as after this time the material rapidly hardens and then gradually returns to the fully condition in four days.

Final Heat Treatment.

Final heat treatment which is required to bring the material back to its full strength and normal condition after being annealed and worked.

The material requires to be uniformly heated to 480° to 500° C., and then quenched in water. Should the material buckle or require straightening after the treatment it should be done within an hour after treatment.

The treated material will become gradually harder during the first four days, after which no further hardening takes place and it may be used for whatever purpose required.

It is most important that the above directions are adhered to in order that the best results may be obtained.

Duralumin Forgings and Stampings From Bar.

The bar is forged from the ingots heat treated in muffle surfaces at 410° C., the ingots being thoroughly "soaked" for at least six hours.

Bar so forged is of 3½ inches or above in diameter. Bar below this is rolled or extruded and as such should a V. T. S. of 25 tons per square inch and elongation of 15 per cent on 2 inches. The thick hammered bar direct from the hammer has a much lower V. T. S., varying from 12 to 17 tons per square inch, due to its not being quenched, and to bring it to its full strength it requires further heat treatment—i. e., the final heat treatment at 480° C. with quenching. This applies also to the drop stamping. In the past the forged or hammered bar was received with "piping" right through the center and "pancakes" had to be forged preparatory to stamping, these "pancakes" being heated to 410° C. Now, however, successful stampings are forged direct from pieces of bar, but strict attention must be paid to the proper and efficient soaking, as the heat treatment is called. The stamping must be done directly on the metal leaving the muffle to ensure the latter being at the correct working temperature. Of course, the metal rapidly cools under the hammer and exhibits cracks at the edges and also gives a distinct ring when too cold for further working, when it should be again put in the muffle, and brought up to 410° C.

The finished stampings or forgings have then to undergo the final heat treatment and this is best done in the salt bath at 480° C., quenching as before after a thorough soaking. The metal should then give its full strength and elongation. It is essential to ensure that the whole of the metal is equally heated right to the center, and this decides the time of immersion or period of "soaking."

Heat Treatment Temperatures.

The latest figures (1917) for the temperature found best for working duralumin are as follows:

Annealing for press work, i. e., on thin plate or strip	350° C.
"Soaking" for stamping or forging on bar	410° C.
Final heat treatment of any finished article	480° C.

The latter temperature can be safely dropped to 450° C., but below 480° C. there is a slight reduction in strength. It is also dangerous to exceed 480° C., since at 500° C. overheating and burning may occur, which is dangerous to the alloy.

Hammered and Extruded Bar.

It should be noticed that the difference between these is, in short, that the former requires and the latter has already received the final heat treatment. The former requires final heat treatment to be carried out on details forged from it. The machining of these details can be carried out immediately after receiving this treatment: i. e., during the cooling and hardening process. The latter is not used for hammered and forged details and articles can be machined from it straight away.

It may be further noted that ordinary paraffin forms an excellent tool lubricant in screwing of finishing machined duralumin.

AIR MINISTRY COMPETITIONS AT MARTHESHAM.

Source: Reliable.

(13094.)

13 August, 1920.

The competitions have been delayed owing to inclement weather and no landing tests have yet been made. Most of the machines at the present writing have completed their full load high-speed tests, endurance flights and slow-speed trials. In the full load speed test a minimum speed of 100 M. P. H. is expected, and marks are awarded for each mile above this figure and forfeited for each mile below. The Avro triplane attained a top speed of only 95.7 M. P. H. The endurance flight consists of two three and one-half hour flights with a period of not more than one hour between.

Speed runs are conducted over a measured mile course and it is the practice to conduct high-speed runs at as low an altitude as possible for single-engine machines (seldom exceeding 20 feet). The slow-speed trials during the competitions are made at an altitude of 3,500 feet. All speeds are ultimately reduced to standard atmospheric conditions.

For low-altitude speed runs the time of the machine is taken when it passes a vane sight located at the first observing point, and another time observation is made when it passes the sight at the second station, 1 mile distant. A reverse run is then made and the mean speed computed.

For high-altitude speed runs two obscure cameras located a known distance apart are used. The axis of one camera is inclined at an angle of 25° to the vertical. On the reflected image of the sky, on a chart board, the image of the machine is pricked off at one-second intervals as it passes across the board and from the field and focal distance of the camera lens from the board the speed deduced. Through the employment of two cameras, with the axis of one inclined to the vertical, the altitude of the observed machine may be checked from time to time.

The method employed by the air ministry for observing the getting off and landing tests is interesting. An imaginary high hedge or fringe of tree tops is represented by a line of small captive balloons over which a machine must pass in coming in for a landing. Measurements are made from the base of the line of the balloons to the point where the machine comes to rest. The accuracy of pilots is measured by their clearance from the top of the balloons, which is photographed as the machine passes over. Small machines and large machines will be required to get off and land within a limit of 175 and 275 yards, respectively. In the getting off tests all machines will start from a fixed mark and endeavor to clear a tape located 175 yards distant for the small machines and 275 yards for the large machines, with the greatest clearance possible. As the tape is graduated in feet and inches, and is conspicuously marked, a photograph of the machine passing over the tape will indicate directly its clearance, which may be measured off on the photograph of the tape.

It is understood that the Austin machine has successfully passed the locked, or hands-off control, test. It is the requirement that machines must fly for a minimum of five minutes without the use of any of the controls. On the occasion of my last visit to Martlesham the Bristol machine failed on the test, getting in a sharp left hand spin at the end of two minutes. It may be relevant at this point to suggest that the fore and aft attitude of most machines can be moderately controlled with the throttle.

Large machines will be required to land and take off with one engine cut out. It is not anticipated that any of the bimotored craft will successfully pass this test.

Throughout the tests the judges' committee will examine and note commendable features of all machines, such as engine and gasoline accessibility, good visibility, ease of starting, etc. Marks will be

assigned for these features. The findings of the committee will be published in due course and these data will, of course, be forwarded to the department when available.

List of entries.

Small aeroplanes:

The Austin "Kestrel," 200-H. P. Beardmore.
The Avro "Triplane," 240-H. P. Siddeley Puma.
The Beardmore W. B.-10, 200-H. P. Beardmore.
The Bristol converted fighter, 240-H. P. Siddeley Puma.
The Westland limousine, 450-H. P. Napier Lion.
The Sopwith "Antelope," 180-H. P. Hispano Suiza.

Large aeroplanes:

The Centaur 2A, 2 160-H. P. Beardmore engines.
The Handley-Page W-8, 2 450-H. P. Napier Lion.
The Vickers Vimy, 2 375-H. P. Rolls Royce Eagle 8 engines.

The judges committee is constituted as follows:

Maj. Gen. Sir F. H. Sykes, G. B. E., K. C. B., C. M. G.
Air Commodore H. R. Brooke-Popham, C. B., C. M. G., D. S. O.
Brig. Gen. R. K. Bagnall Wild, C. M. G., C. B. E.
Wing Commander W. D. Beatty, C. B. E., A. F. C.
Mr. C. B. Cockburn.
Lieut. Col. J. L. Travers, O. B. E.
Lieut. Col. H. W. S. Outram, C. B. E.
Squadron Leader V. S. Brown.
Squadron Leader V. Dandford.
Maj. P. Bishop, O. B. E.
Squadron Leader T. O'B. Hubbard, M. C., A. F. C. (secretary).

AIR SERVICE BETWEEN DENMARK, GERMANY, NETHERLANDS, AND ENGLAND.

Source: Reliable.

(7424)

26 July, 1920.

The projected air service between Copenhagen, Germany, Netherlands, and England will soon be opened. The German air service companies will cooperate with a Danish Company for flights between Copenhagen-Warnemunde and Copenhagen-Hamburg. The German air-shipping company will carry passengers and post to Amsterdam, from where English and Dutch aeroplanes will take over for further transport. The tariff for passengers from Copenhagen to Hamburg or Warnemunde probably will be 300 Danish kronen, from Copenhagen to Amsterdam 600 kronen, to London 900 kronen. Letter taxes will be, respectively, 1½ kronen and 2 kronen.

AVIATION BUREAU ESTABLISHED IN WAR DEPARTMENT.

Source: Reliable.

(6591.)

19 August, 1920.

The establishment of an aviation bureau from August 1 is announced, under the direct control of the minister of war. It is to be responsible for the guidance, encouragement, and protection of aeronautic undertakings of a nonmilitary nature. According to the regulations promulgated, the bureau will be in charge of a chief, either a general or admiral on the active list, assisted by a vice chief, secretaries, and engineers. This is doubtless intended to ensure that all aviation in Japan shall be an auxiliary arm of the national defense service.

ENGINEERING.

SULZER BROS. WORKS, WINTERTHUR, SWITZERLAND.

Source: Reliable.

(13479.)

12 August, 1920.

Submarine Engines for Japan.

Two submarine engines for the Japanese Navy were noted. They were about 75–90 per cent completed, and it is expected that tests on test stand will be conducted in the early part of September and the official shop tests will be conducted the latter part of September or early in October. There are four or five Japanese inspectors at the Sulzer plant, either officially attached for this purpose or there in some capacity, which permits them to inspect the engines as well as gather all engine information that may be picked up hrough-out the plant.

The engines are 8-cylinder, 2-cycle, 3,000 B. H. P., 320 R. P. M., water-cooled pistons. They are so designed by Sulzer Bros. that, although rated at 3,000 B. H. P., they can develop for short periods 4,000 B. H. P.; they can also develop for reasonably long periods 3,600 B. H. P.

Tests already conducted make it reasonably certain that the oil consumption of these engines will be very close to 0.42 pound per H. P. hour.

It has been said that it is a Japanese policy to order one or two sets of engines of the latest type and design in order that inspectors may be sent to the plant to obtain access to all plans, design calculations, etc., and to ultimately obtain a complete set of plans as well as the engines. It very seldom happened that the original order was duplicated. It was inferred that the Japanese were at the present time bargaining for the next largest design of Sulzer engine for submarine purposes, and it appeared that they had made tentative offers for the purchase of two sets of 5,000 B. H. P. engines. It is understood that Sulzer Bros., have fairly complete designs for this size of submarine engine, but there was no evidence of construction of such sizes of engines.

Busch-Sulzer Engines.

It was inferred that Sulzer Bros., designing engineers, did not approve of many of the so-called improvements incorporated in their original design, by Mr. Rotter, the chief engineer of Busch-Sulzer. It was frankly stated that some of the so-called improve-

ments really interfered with the efficiency of the engines for the purposes intended, and they looked upon a number of the changes that have been made in the United States with a very critical eye. It is understood that they have a ten-year contract with Busch-Sulzer and that this contract has several years yet to run.

Diesel Engines for Merchant Marine.

The opinion was expressed that Sulzer Bros. had not been foresighted enough to be prepared for undertaking a large amount of engine work for the merchant marine, and it was felt that they had lost a good deal of business, due to the fact that most of their work had been for the navies of various countries. The opinion was also expressed that the Busch-Sulzer Co. in America had also been too slow in negotiating for merchant marine Diesel engine work.

Undoubtedly Sulzer Bros. at the present time are in the market for merchant-marine orders wherever they can be obtained, and they feel sure that they, with the plant available and their designing staff, together with experience obtained, both in naval work and merchant-marine work, are in a position to manufacture the best Diesel engine in the world.

While their submarine engines are ordinarily 6-cylinder, their merchant engines are ordinarily 4-cylinder. The Japanese submarine engines are special and have 8 cylinders, as noted previously. The merchant engines are rated from 105 B. H. P. per cylinder to 1,750 B. H. P. per cylinder. The most common type is a 4-cylinder engine developing 420 H. P. They have a number of orders for merchant-marine installations for ships ranging from 5,000 to 12,000 tons, and the H. P. of the engines for these ships ranges from 4,000 to 7,000 B. H. P.

The actual oil consumption of engines tested for merchant marine have produced results warranting them in stating that this oil consumption will be 0.40 pound per H. P. hour.

One of the largest and most important French firms engaged in merchant-marine shipping business has just placed orders for marine Diesels, and Sulzer Bros. expect other French firms to follow the lead, as this particular firm has a reputation of leading the way in matters of this kind. Sulzer Bros. have agents in Denmark, Norway, Sweden, and in Germany, feeling out the market conditions for orders for their type of engine.

Foreign Competitors.

The following statements were made by Sulzer Bros.' representatives relative to other types of Diesel engines:

(*a*) *The Burmeister & Wayne* engines are too heavy; on a weight and cost basis, Sulzer Bros.' engines are superior, especially if accurate ratings of the engines are given.

(*b*) *Fullagar* engine is considered too experimental and requires another year of development work to prove its efficiency. It may be satisfactory for large H. P. engines, but it is believed that they have several years of trial and error ahead of them before a satisfactory design is obtained.

(*c*) *Tosi.*—Comments were made on the published reports of the Tosi comparisons between 4-cycle and 2-cycle engines. It will be remembered that the conclusions arrived at by Tosi were to the general effect that the 4-cycle engine was superior. Sulzer representatives were not inclined to believe that a comparative test made by Tosi several years ago was in exact accordance with the published data relative thereto. It was stated that while Tosi proved the 4-cycle engine to be the best and accepted orders for this type, they are now asking Sulzer Bros. to cover them and their contracts with Sulzer Bros.' 2-cycle engines. It was stated that Sulzer Bros. were not likely to cover Tosi in his contracts, as they feel they could obtain plenty of business without helping out a rival manufacturer.

(*d*) *Schneider & Co.*—It was stated that this firm had a contract for two 3,000 B. H. P. engines for French submarines, and that these orders had been canceled at the request of Schneider & Co., as they did not believe that the engines as designed would satisfactorily develop the H. P. called for.

It was also stated that another French firm had a similar contract and was endeavoring to have the French Government authorize the cancellation of this contract for similar reasons. The French Government officials are understood to be in close touch with the progress of the construction of the Japanese submarine engines and are awaiting results of the official tests before they take final action on the cancellation of the contract referred to above. If the official tests of the Japanese engines are anything like as satisfactory as expected, Sulzer Bros. expect to obtain orders from the French Government for similar engines.

(*e*) *Ansaldo-San Georgio.*—Sulzer Bros. are suing this firm for infringement of patents. They claim that the scavenger system on their engines is a direct steal from Sulzer Bros.' scavenger system. Sulzer Bros. have furnished a number of engines to the Italian Government, and some of them were furnished through Ansaldo (formerly Fiat). Representatives of Sulzer Bros. have inspected recent engines manufactured by Ansaldo, and as a result of this inspection are suing Ansaldo for infringement.

(*f*) *German engines.*—Sulzer Bros. are suing the M. A. N. for infringement of patents, and here again they claim that the scavenger system used on German 2-cycle engines infringes their patent rights.

(*g*) *Great Britain.*—There are three authorized agents of Sulzer Bros. in Great Britain, as follows: Denny Bros., Dumbarton; Arm-

strong, Whitworth & Co. (Ltd.), Newcastle; and Stevens, on the Clyde.

A representative of the British Admiralty recently made an inspection tour of Sulzer Bros.' plant, and it is understood was very much pleased with what was seen there.

In 1915 the British Government bought practically all the available stock of Sulzer Bros.' marine engines, in order to prevent them falling into the hands of the enemy. It is understood that no use has ever been made of this equipment and that it has recently been put up for sale.

It is well known that the British purchased from Sulzer Bros. two sets of 2,000 B. H. P. 2-cycle engines for installation in submarines, but these engines have never been installed, and it appears doubtful whether they will be installed in the near future. Sulzer Bros. are of the opinion that one of the reasons for the British not using these engines is the influence of Vickers & Co. (Ltd.), over installations of this kind.

(*h*) *France.*—It has been stated that before the war the French Navy Department had placed an order with Sulzer Bros. for Diesel engines for installation in a battleship. It was stated that these engines were to develop 12,000 B. H. P. It does not seem likely that the H. P. would be sufficient for the purpose so far as the battleship was concerned, but there is no doubt that Sulzer Bros. had an order for 12,000 B. H. P. Diesel engines for some ship in the French Navy. The order was canceled early in the war. The only interest this order has at the present time is that as a result of the investigations then conducted, Sulzer Bros. developed an experimental cylinder to deliver 2,000 B. H. P. They claim that this experiment is a success.

Sulzer Bros.' Plant.

The works are very busy at the present time, and considerable expansion is contemplated. Five thousand men are employed, and they work on a 48-hour per week basis. As much of the work as is practicable is done by piecework.

They have had very little difficulty so far as actual strikes are concerned, but production is not nearly up to prewar standards. It was estimated that the men only produce from 50 to 75 per cent as much now as they did in 1914.

Small Engines.

The smallest 2-cycle engine developed by Sulzer Bros. is a 4-cycle 100 B. H. P. for yachts or similar vessels. This engine is entirely too heavy for motor boats, and Sulzer Bros. do not consider a 2-cycle engine suitable for motor-boat installation. Furthermore, they have not had time to attempt to develop an engine of this character, even though it might have possibilities.

Two-Cycle Versus Four-Cycle.

They discussed with interest many of the controversial points relative to the various merits and demerits of 2-cycle versus 4-cycle engines. Most of these discussions have appeared in the technical press from time to time and will not be repeated. Naturally, Sulzer Bros. are ardent advocates of 2-cycle engines and believe that with the latest improvements they are in a position to compete with the best product of their rivals.

Improvements.

Particular stress was placed upon the new type of turbo-scavenging pump. This turbo scavenger is driven by a D. C. motor of very high R. P. M. (3,200). Some difficulties were experienced in obtaining a satisfactory motor on account of the very great R. P. M. necessary, but there is an electrical concern in Switzerland that has solved these difficulties. They have also developed a turbo-oil feed blower which has materially improved the operating efficiency of the engine. In this connection it is of interest to note that W. A. Reavell, of Reavell & Co. (Ltd.), Ipswich, England, has recently taken up with Sulzer Bros. the question of fitting turbo blowers to Diesel engines.

The thickness of the piston has been materially reduced, which has also materially reduced the heating difficulties formerly experienced.

The greatest stress was laid upon the fact that in their latest designs of cylinder head the construction had been so improved that heat cracking had practically been eliminated. There is only one hole in the cylinder head to take the combined fuel and starting valve. The scavenging is done through ports from below. This makes the matter a much better job and simplifies construction very materially. This is one of their strong talking points when comparing their engines with 4-cycle engines.

They report that the tooth clutch now in use by them has proven satisfactory and their reports from service experience indicate that this clutch has proven efficient.

They recently tested a single cylinder constructed for a submarine engine and designed to give 340 B. H. P.; satisfactory results were obtained. They then proceeded to test this cylinder to develop 540 B. H. P., and everything functioned satisfactorily even with this very large increase in B. H. P developed. This information was given to show that their B. H. P. per cylinder ratings were always lower than could be satisfactorily developed by the cylinder, and that their engines were rated lower than the ratings given by their competitors to the engines manufactured by these competitors. While Sulzer Bros. make a specialty of 2-cycle engines and manufacture nothing else for marine purposess, they do manufacture 4-cycle engines, but only for land use.

The question of vibration and the question of broken shafts were discussed. It developed that Sulzer Bros. have an expert assigned to this work who spends all of his time on the question of design of shafts for the purpose of determining in each case the critical speeds of each engine. With the data produced it is then practical to so design the engine that the critical speed will be either so low or so high that neither will be used in service. In other words, the working range of speeds is determined and the engine so designed that the critical speeds fall outside of this range.

The question of torsional vibration is treated on mathematical lines and this treatment is then combined with practical test work in the shop. These results are further combined with the experience in service, and every effort is made to determine from precedent just what changes are likely to occur in the critical speed when the engine is transferred from the test stand to the ship. It was stated that with the above procedure they had been able to avoid, to a very large degree, any difficulties with regard to breakages of shafts

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AUGSBURG PLANT.

Source: Reliable.

(13542)

16 August, 1920.

The Augsburg plant is a very large engineering concern, the primary output of which is Diesel engines. Heretofore, they have gone in more extensively for marine Diesels than for other types but they have also manufactured a large number of land engines.

A large part of the plant is given up to the manufacture of print presses, which is the second most important output. The third most important output is refrigeration units which they build for the ammonia process and for the carbon-dioxide process.

At the present time, they are also engaged in overhauling and repairing locomotives, railway cars, and such other machine repair work as becomes available.

They employ at the present time about 5,000 men. They work on an 8-hour-a-day basis and usually work 48 hours a week, although at the present time it has been cut down to 39 hours a week because of scarcity of work. As much piecework is done as is practicable, and the men apparently take kindly to piecework. Working hours vary, but most of the men work from 6 a. m. to 2.15 p. m., with 15 minutes out for refreshments. They have also tried working from 8 to 4 without any time off and they have also tried working from 8 to 5.30, with one and a half hours off for dinner. Office hours for the technical assistants and clerical force are usually from 8 to 12 and from 2 to 6. Those assistants with positions of responsibility

do not have any hard-and-fast office hours. During the war 10,000 men were employed at this plant, and they usually worked in shifts, 24 hours a day, in all parts of the plant where practicable. In addition to the engine work, they took on various forms of munition work, including manufacture of shells and guns.

At the time of the armistice they had one order for 420 cylinders for the 3,000 B. H. P. submarine engines. All of these orders were canceled.

The submarine engines that were completed at the time of the armistice were converted as rapidly as practicable for use as land engines. This was readily done by removing the reversing gear and changing the oil-feed attachments so that tar oil could be utilized. It was stated that the results were very satisfactory and the engines very efficient.

At the present time, the Augsburg plant is going in actively for merchant Diesel engines. The product in hand is of the 4-cycle type although they are doing a good deal of experimental work on a 2-cycle double-acting design. This double-acting type of engine has been proceeded with far enough to indicate that it will be a success.

A number of 3,000 B. H. P. 10-cylinder engines similar to those installed on *U–140* and class were seen; also saw a number of 6-cylinder 1,200 B. H. P. engines and a still larger number of 6-cylinder B. H. P. engines similar to those installed on U-boats and U–C boats, respectively.

As is well known, the Augsburg plant strongly favors the 4-cycle engine while the Nuremberg plant favors the 2-cycle engine. However, there have been built at Augsburg a few 2-cycle engines and they have great expectations for their 2-cycle double-acting engine for the merchant marine.

The power employed in the plant is of three kinds, viz, Diesel engine, electric, and hydraulic. Most of the machine tools are run on belt drives although a few of the more modern tools are electrically driven by separate motor.

In the power house there were noted one double-acting 4-cycle Diesel engine which developed 600 B. H. P. This is a horizontal engine and was an experiment. It has not been repeated although it is still in use.

Elaborate test stands were noted throughout the plant indicating that each engine was thoroughly tested before it went into service.

This firm is as thoroughly convinced of the merits of oil cooling for pistons as Sulzer Bros. are convinced of the merits of water cooling for the same purpose.

When questioned about shafting difficulties, particularly shaft breakages, the information was given that they had had very few

difficulties of this character. It is worth while noting this point, especially in view of the difficulties experienced by the Electric Boat Co. as, for example, on *S–1*.

It was stated that large Diesel engines of great B. H. P. ran just as well as the smaller types of engines.

Merchant Marine Engines.

Their product for merchant marine engines consisted of 4-cylinder and 6-cylinder units ranging from 1,200 B. H. P. to 2,000 B. H. P. The largest engines under construction were stated to have a B. H. P. of 3,000 to 4,000 in 6 cylinders. These are all single-acting 4-cycle engines. One opinion given was that a single-acting 4-cycle engine was good enough for the merchant marine and that it was not considered necessary to go into double-acting engines. It was also stated that but little was expected from the efforts being made to construct double-acting 4-cycle engines, but as there was a field for double-acting 2-cycle engines the M. A. N. concern was going ahead as rapidly as practicable to produce this type of engine.

M. A. N.—Other Plants.

The M. A. N. controls four engineering plants—Augsburg, Nuremberg, Deslau, and Gesterman.

Nuremberg no longer builds Diesel engines, and while it is the most modern plant, it has now been given over to building railway machinery, railway carriages, winches, cranes, and general overhaul work. About 5,000 men are employed.

Deslau furnishes castings and does a good deal of the iron work. Gesterman does most of the large foundry work and steel work.

At Augsburg, in addition to the plant mentioned above, there is a very large copper and composition foundry; small iron castings are also made in the Augsburg plant. There is an up-to-date forging shop capable of handling all small forgings. The large forgings are obtained from Gesterman.

Rival Concerns of M. A. N.

One authority rated the best Diesel engines in the following order:

(1) M. A. N.
(2) Sulzer Bros.
(3) Burmesiter & Wayne.

An inquiry was made concerning Dr. Junker's engine, particularly his double-acting type, and the opinion was given that this engine was not a success and had several years of experimental work ahead of it before it could be considered a satisfactory commercial proposition.

Sulzer Bros. were mentioned as their "best rival."

The foregoing gives a general outline of the situation as it existed early in August, 1920.

JAPANESE SUBMARINES.

Source: Reliable.

(6452-A.)

17 August, 1920.

The following characteristics have been ascertained relative to submarines under construction in Japan at the present time. These characteristics are understood to refer to nine boats which are well under way or nearing completion:

Surface displacement	896 tons.
Submerged displacement	1,100 tons.
Surface speed	18 knots.
Submerged speed	10 knots.
Engines	Two 1,300 B. H. P. two-cycle Sulzer engines.
Armament	Two 18-inch deck tubes fitted forward of the conning tower, one on either side. Four 18-inch bow tubes.

Stowage space for 18 torpedoes as follows: Two in the deck tubes, 4 in the bow tubes, and 12 spare torpedoes in the torpedo room.

The design of this boat shows a rather interesting mixture of British, German, and French construction. The steering gear diving gear and auxiliary gear are operated on the Hele-Shaw hydraulic system, which follows British installation. The torpedo armament and arrangement resembles French construction The hull of the vessel resembles German construction, although some admixture of French hull construction appears also to have been followed in the strength of the hull. There is a long parallel middle body from the torpedo room to the engine room; then there is a slight bulge to take care of the engine room, i. e., the diameter of the strength hull is increased in the engine room to afford adequate space for the engines.

The double hull does not completely surround the strength hull but is cut off at either side of the keel. The keel is in the shape of a box girder and is used for ballast, but not for drainage purposes. The strength bulkheads are straight and not curved as in German practice.

This group of 9 boats is understood to be a part of the Japanese building program of so-called 800-ton boats, of which there is a total of 24 boats.

In this connection, it is of interest to note that the Japanese probably purchased during the war Admiralty plans of the British L class. At any rate, they have completed some submarines which closely resemble the British L class, and I understand that they have had some difficulties in obtaining the proper trim of these completed boats. It is understood that they are down by the bow and that a rearrangement of ballast in the keel has been necessary.

COMMUNICATIONS.

"TELEFUNKEN IN THE GERMAN ARMY."

Source: "Telefunken-Zeitung."

(13513.)

Portable Stations.

During the war wireless telegraphy developed to a degree of military importance that had not been in the least anticipated. It is true that at the beginning of the war the Army was equipped with a comparatively small number of portable stations of the lighter and heavier types, but these could only be employed in mobile warfare. The latter, however, soon subsided into stationary warfare—trench warfare—and thus an entirely new situation was created. The employment of light signals was rendered difficult by swaths of powder gases and by the fact that the flashing of the lights betrayed the signaling positions to the enemy. The telephone wires were unable to resist the mighty drum fire which was used for the first time in this war. This often led to very regrettable military occurrences. It happened, for instance, that garrisons of trenches in which the field telephone wires had been shot away were captured by the enemy and that the reinforcements sent to them too late were lost also. There was thus a crying need for wireless trench stations light enough to be transported by the soldiers.

By the end of 1914 the Telefunken Co. had already turned out some of these. The latter, however, still worked with earth currents. During the military tests of the same in the beginning of 1915 in the fortress region of Lille ranges of 4 km. were attained.

Then, after Telefunken had submitted a complete station and exhibited it in operation in June, 1915, in Lille, several stations of this type were delivered.

"*Funkenkleinstation*" (*small power wireless station G–Fuk 16*).—At the same time Telefunken also developed trench stations of the quench-spark system. The first of these was delivered in April, 1916, to the military authorities. They were of course portable and each outfit was divided into five packs containing all the separate parts appertaining to the stations —antenna, generating outfit, transmitter, receiver, and amplifier. As experience proved that the individual packs were still too heavy to be carried forward into the trenches, a new type had to be developed in which the weight of the individual packs was restricted to 12 kg. The station then consisted of 13 separate packs and was entitled "Small portable station, type G–Fuk 16."

In November, 1917, Telefunken furnished the five-hundredth station of this type. In most instances the power was derived from a double pedal wheel or a Bosch 2-cylinder generator. The pedal wheel

drove an engine of 4,000 revolutions and 500 cycles with alternating current which was coupled with an exciter. The output of the engine was about 250 watts with a working voltage of 110 volts. The transmitter is a normal quench-spark transmitter with waves of three different lengths in the primary circuit, namely, 350m., 450m., and 550m.; the syntonizing apparatus is continuously adjustable within the scope of the antenna. The station can work with antenna of every description. The receiver allows of a wave reception of 150m. to 850m., with both the direct and the intermediate circuit switch, and when a special coil is added a wave reception of 3,000m. and over is obtainable.

Packs of the "Funkenkleinstation" G–Fuk 16–a.—A great number of smaller trench stations were also constructed, so-called storm troop stations (shell-hole stations). The current, which was derived from accumulators, was converted by buzzers or pendulum circuit breakers.

The current generator, transmitter, receiver, and antenna are here assembled in an outfit weighing 18 kg. The accumulator, weighing 6 kg., can also be transported separately. For transmission, three wave lengths are provided, 150m., 225m., and 300m. The receiver permits of a direct reception of wave lengths of from 150m. to 600m. An intermediate circuit receiver with wider range and an amplifier can be joined on by a connection plug. (See illustration: Little resonant wireless station, type AKS 58.)

With the ever-increasing number of wireless stations within a narrow telegraphic zone the characteristics of the quench-spark system made themselves felt.

Photo of the Five-hundredth "Funkenkleinstation."

In this system the wave transmitted allows only a restricted number of stations to work simultaneously within a limited zone because of the damping and amplitude necessitated by the spark. Thus progress was pressing toward the introduction of undamped trench stations.

The construction of undamped devices for the trench stations was commenced by Telefunken in May, 1917. By the end of June the first transmitters were installed; they were the direct transmitters (type ARS 60), with a range of from 250m to 550m. and a 5-watt tube (RS 5).

The reception of the undamped waves was done by arranging the normal detector receiver for beat reception. The beats were generated by the wave train of the distant transmitter and the wave train of the small transmitter which were added to the receiving apparatus (heterodyne). This transmitter was constructed for a certain antenna and was not able to operate with the various trench antennæ which were being used at the front without the addition of an amplifier booster. Therefore Telefunken now passed on to a transmitter with intermediate circuit which, in contrast to the transmitter with direct switch, possessed the advantage that no harmonic vibrations were emitted.

Appliance With Hand Drive For Operating Portable Tube Transmitter Stations.

At the same time demands came from the front (where meanwhile experiments with undamped devices were taking place) for instruments with wider range and for a combined transmitter and receiver.

Little Resonant Wireless Station (Shell Hole Station).

Thus there came into existence the intermediate circuit transmitter (type ARS 63) fitted with a secondary receiver for a range of 300 to 3,000 m., and able to work with trench antennæ of every description and with comparatively high damping.

Pedal Device For the Operation of a "Funkenkleinstation," G-Fuk 16a.

Insulated ground cables were used in the foremost positions. These were either simply laid along the ground or shot forward by rockets. Symmetrical antennæ of 20 to 40 m. cable lengths were used throughout. Where possible the antennæ wires were insulated until reaching the outside of the dugout and were then elevated 1 to 2 m. above the ground. In some cases a good range was obtained with antennæ that were extended simply in the dugout and which projected only a short distance out of the trench. Of course farther back the antennæ could be built higher, and thus considerably wider ranges could be obtained.

However, this apparatus, with its complicated construction, was not yet serviceable for the field, and in addition, the "Wireless Experimental Field," which had meanwhile been founded at Namur, was requesting the construction of a combined—and likewise a separated transmitter—receiver in which the range might be somewhat restricted in favor of greater power and a simpler construction.

Hand in hand with the wireless experimental field two types of serviceable wireless instruments for the front were now constructed, namely:

(1) A combined D instrument in a portable box to be carried on the back, transmitter in intermediate circuit switch with an RS transmitter tube, wave circumference of 300 to 1,600 m., call-signal device, secondary-back-coupling-receiver with two parallel receiving tubes for resonant and undamped reception, buzzer tuning for antenna, likewise;

(2) An F instrument, with transmitter execution the same as above, but with Audion-primary-secondary-receiver for a wave circumference of 300 to 2,000 m.

The power was derived from a small rotary converter driven by a 12-volt battery or by a device with hand drive to be operated by one man.

Oldest Tube Transmitter For the Trenches.

Out of these two instruments a single one was later created by the insertion of a commutator in the interior of the transmitter for antennæ with weak and strong dampings of any strength, undamped

as well as resonant (with alternating current); furthermore it could be used for resonant and undamped reception, and, with the addition of an amplifier, it could be used for telephoning. With these instruments good ranges were obtained in all cases. In one case, which occurred in actual practice, both instruments had, for instance, to bridge a distance of about 600 km. over land with elevated antennæ at an average height of 50 m. They accomplished this without a sound amplifier.

Small Tube Transmitter, Type ARS 69.

In a division section with a front of 2 km. it was possible for 25 of these wireless outfits to operate simultaneously (instead of the 12 as provided) in consequence of their ability to work with waves of very little difference in length.

Thus the military posts in question, working in close conjunction with each other and with Telefunken, created a great variety of the "Funkenkleinstation" (small power wireless stations), which were in every way adapted to stationary warfare, and on account of their lightness and portability there was hardly ever an obstruction to their employment, because wherever man could go, whether high up in the mountains in the dugout or the shelter, the shell hole of the ruins of a house, these light portable appliances could be put into service at once in order to effect communication with the commanding posts.

By the end of May, 1918, the first 100 outfits were sent to the front to be tried out, and they proved to be thoroughly satisfactory, so that after some very slight improvements the work of manufacturing them in large numbers could be commenced.

Tube Transmitter-Receiver, Type ARS 68.

The extent of the deliveries may be seen in the following table (of the Tafunk type as follows):

The 500 G-Fuk apparatus	on November 12, 1917.
The 1,000 C-machine	on September 27, 1917.
The 3,000 receiver E-170	on October 25, 1918.
The 2,000 two-stage amplifier	on May 5, 1918.
The 4,000 U. S. apparatus	on October 28, 1918.

Skirmishing Station, Assembled.

The utility of the outfits was tremendously increased, in trench warfare also, by the introduction of the undamped vibrations, as against the quench spark system. As mentioned above, it was possible for over 20 stations with a difference in wave length of only 20 m. to be operated simultaneously without disturbing each other; whereas, with the damped transmitters, it was hardly possible to work with a wave difference of 100 m. at such close quarters. The reeducation of our wireless operators, who had hitherto only been accustomed to resonant appliances, was successfully accomplished in an astonishingly short time. In this the extreme simplicity of operating

these stations was a contributory factor of importance. It was found also to be absolutely necessary to provide a call-signal device, as otherwise the calling station could not be easily distinguished in consequence of the very close tuning.

Skirmishing Station.

By simply connecting a microphone to the antenna these appliances could also be used for wireless telephoning for short distances.

Temporary Construction of Wooden Mast as Antenna Support.

For the purpose of easier transportation these appliances may, if desired, be fitted into two-wheeled carts (such as mine-thrower carts) in such a way as to be ready for operation. Generally speaking, earth antennæ only, with strong damping were used at first. Later, however, because of the wide range which may be obtained with undamped transmitters on the elevated antennæ with weak damping the employment of the latter kind also became a necessity. This problem was solved in the simplest manner by the addition of a switch for changing over the anode and the grid coupling.

These appliances are thus insured of a manifold utilization after the war, for instance, as small land stations, telephone stations for short distances, naval landing stations, emergency transmitters for vessels or airships, as ship stations for fishing steamers, etc.

DIRECT RADIO SERVICE BETWEEN ARGENTINA AND GERMANY.

Source: Reliable.

21 July, 1920.

Under the name of the Transradio, a new German-Argentine radiotelegraphic company has been organized for the purpose of establishing direct radio service between Germany and the southern countries of South America. This company is authorized in Argentina under a Government decree of April, 1920, which granted a concession for the installation of a high-power radiotelegraphic station.

The capital of the company will be 10,000,000 pesos ($4,300,000), of which it is claimed that 4,500,000 pesos are already subscribed in Germany. Subscriptions for stock are being received in Argentina, and considerable publicity is being given to the project. The statements of the advertisers are to the effect that the radio station will be ready for sending messages early in 1922, and that commercial messages will be sent at rates approximately equal to one-third of the present cable rates. The general manager of the company is Richard Diercks, general manager of the Siemens-Schuckert Co. Other officials of the company are influential Argentines, and Germans prominently connected with the Banco Germanico de la America del Sud, and the Banco Aleman Transatlantico.

Dates for completion of vessels.

BATTLESHIPS.

North Dakota	New York	Oct. 15.	Michigan	Philadelphia	Indefinite.
Tennessee	do	Oct. 1.	New Hampshire	do	Do.
Connecticut	Philadelphia	Indefinite.	South Carolina	do	Do.
Kansas	do	Sept. 27.	Mississippi	Puget Sound	Oct. 1.
Louisiana [1]	do	Indefinite.	Texas	do	Do.

CRUISERS AND GUNBOATS.

Paducah	Portsmouth	Oct. 15.	Denver	Mare Island	Indefinite.
Chester (res.)	Boston	Indefinite.	Charleston	Puget Sound	Nov. 30.
Dolphin	do	Oct. 1.	Missoula (ex-Montana).	do	Indefinite.
Niagara	New York	Oct. 16.	Charlotte (ex-North Carolina).	do	Do.
Asheville	Charleston	Sept. 23.	Seattle	do	Do.
Birmingham	Mare Island	Oct. 15.			
Brooklyn	do	Do.			

DESTROYERS.

Colhoun	Portsmouth	Indefinite.	A. P. Upshur (fitting out).	Norfolk	Indefinite.
Israel (res.)	do	Do.	Benham (res.)	do	Do.
McKee (res.)	do	Do.	Clemson (res.)	do	Do.
Ringgold (res.)	do	Do.	Connor (res.)	do	Do.
Robinson (res.)	do	Do.	Dallas (fitting out)	do	Do.
Stevens	do	Do.	Downes (res.)	do	Do.
Taylor (res.)	do	Do.	Duncan (res.)	do	Do.
Case	Boston	Do.	Herndon (fitting out)	do	Sept. 30.
Conyngham (res.)	do	Do.	Hulbert (building)	do	Oct. 8.
Cowell (res.)	do	Do.	Hunt (fitting out)	do	Indefinite.
Foote (res.)	do	Do.	Parker (res.)	do	Do.
Isherwood	do	Sept. 25.	Wm. B. Preston	do	Oct. 1.
Kalk (res.)	do	Indefinite.	W. C. Wood (fitting out).	do	Indefinite.
Kimberly (res.)	do	Do.	Aaron Ward	Mare Island	Oct. 14.
Luce (res.)	do	Do.	Badger	do	Indefinite.
Maddox (res.)	do	Do.	Buchanan	do	Oct. 14.
Mahan	do	Oct. 25.	Chauncey	do	Indefinite.
Meredith (res.)	do	Indefinite.	Evans	do	Oct. 14.
Murray	do	Oct. 25.	Philip	do	Do.
Pruitt	do	Indefinite.	Thornton	do	Indefinite.
Sharkey	do	Sept. 21.	Wickes	do	Oct. 14.
Abbott	New York	Indefinite.	Woolsey	do	Do.
McDougal (res.)	do	Do.	Dent (res.)	Puget Sound	Nov. 15.
Sampson	do	Do.	Dorsey (res.)	do	Nov. 30.
Tattnall	do	Do.	Edwards (res.)	do	Dec. 15.
Diddle	Philadelphia	Do.	Prairie (tender)	do	Oct. 15.
Breckenridge	do	Do.	Roper (res.)	do	Nov. 15.
Cassin	do	Do.	Rathburne	do	Nov. 30.
Harding	do	Oct. 9.	Talbot (res.)	do	Do.
Porter	do	Indefinite.	Waters (res.)	do	Nov. 15.
Shaw	do	Do.			
J. F. Talbot	do	Do.			

SUBMARINES AND SUBMARINE TENDERS.

S-3, 4, 6, 7, 8	Portsmouth	Oct. 10.	AA-1	Norfolk	Indefinite.
O-1, 4	Boston	Nov. 3.	Bushnell	do	Oct. 15.
Rainbow	do	Oct. 9.	Camden	do	Nov. 13.
Savannah	do	Indefinite.	R-1, 2, 3, 4, 5, 6, 7, 8, 9, 10.	do	Do.
K-1, 2, 3, 4, 5, 6, 7, 8	Philadelphia	Do.			
N-4, 6	do	Do.	L-9	do	Indefinite.
S-2	do	Do.	H-4, 6	Mare Island	Do.

FLEET TENDERS (TRAIN).

Cormorant	Portsmouth	Indefinite.	Nereus	Norfolk	Oct. 10.
Rappahannock (res.)	do	Do.	Teal	Charleston	Indefinite.
Culgoa	New York	Do.	Comfort (Ord.)	Mare Island	Do.
Maumee	do	Do.	Glacier	do	Sept. 30.
Robin	do	Do.	Ontario	do	Do.

[1] To be placed out of commission Nov. 15.

Dates for completion of vessels—Continued.

MINE FORCES.

Auk	Portsmouth	Indefinite.	Osprey	Portsmouth	Indefinite.
Curlew	do	Do.	Swan	do	Do.
Flamingo	do	Do.	Woodcock	do	Do.
Grebe	do	Oct. 15.	Widgeon	Charleston	Do.

MISCELLANEOUS.

Patuxent	Portsmouth	Indefinite.	Hannibal (res.)	Philadelphia	Dec. 15.
Aramis	New York	Do.	Langley	Norfolk	Indefinite.
Nokomis	do	Do.			

N. O. T. S.

Long Beach	Portsmouth	Oct. 1.	Quincy	Norfolk	Dec. 1.
Henderson	Philadelphia	Oct. 2.	Pensacola	Mare Island	Oct. 20.
Hancock	do	Do.	Houston	Puget Sound	Dec. 31.
Caesar	Norfolk	Indefinite.			

EAGLE BOATS.

Eagle No. 23	Portsmouth	Indefinite.	Eagle No. 25	Philadelphia	Indefinite.
Eagle No. 29	do	Do.	Eagle No. 60	Norfolk	Do.
Eagle No. 51	do	Oct. 15.	Eagle No. 7	Charleston	Sept. 25.
Eagle No. 54	do	Sept. 30.	Eagle No. 57	Puget Sound	Indefinite.

U. S. SHIPPING BOARD.

Otsego	Portsmouth	Indefinite.	Agamemnon	New York	Indefinite.
Peacock	do	Do.	Chatauqua	do	Do.
Actus	Boston	Oct. 9.	Lake Deval	do	Do.
Black Arrow	do	Indefinite.	Warbler	Philadelphia	Do.
George Washington	do	Do.	Willet	do	Do.

BATTLESHIPS OUT OF COMMISSION.

Coast B. S. No. 1 [1]	Philadelphia.	Maine [1]	Philadelphia.
Coast B. S. No. 2 [1]	Do.	Missouri [1]	Do.
Alabama [1]	Do.	Rhode Island [1]	Mare Island.
Illinois [1]	Do.	Vermont [1]	Do.
Kearsarge [1]	Do.	Wisconsin [1]	Philadelphia.
Kentucky [1]	Do.	Nebraska [1]	Mare Island.
New Jersey [1]	Boston.	Georgia [1]	Do.
Virginia [1]	Do.		

BATTLESHIPS UNDER REDUCED COMMISSION.

Louisiana [2] ..... Philadelphia

CRUISERS, GUNBOATS, AND MISCELLANEOUS OUT OF COMMISSION.

Dubuque [3]	Portsmouth.	Nashville [1]	Charleston.
Huntington [4]	Do.	Raleigh [4]	Do.
Isabel	Philadelphia.	Topeka	Do.
Ozark	Do.	Monadnock [4]	Olongapo.
Pueblo [1]	Do.	Castine [5]	New Orleans.
Tonopah [1]	Do.	Wheeling	Do.
Yankton [4]	Do.	Bay Ocean [4]	Mare Island.
Jupiter [5]	Norfolk.	Machias [5]	Do.
Standish [4]	Do.	Marblehead [4]	Do.
Wasp [4]	Do.	Supply	Do.
Winchester [4]	Do.	Yorktown [4]	Do.

TORPEDO BOATS OUT OF COMMISSION.

C. T. B. No. 6 (Morris) [1]	Newport.	Hopkins [4]	Philadelphia.
C. T. B. No. 16. (Thornton) [1 4]	Norfolk.		

[1] No work being done.
[2] To be placed out of commission.
[3] General repairs.
[4] To be sold.
[5] Conversion into aeroplane carrier. To be used for depth-charge experiments. Repairs completed.

EAGLE BOATS IN ORDINARY.

AT PORTSMOUTH.

Eagle No. 1.	Eagle No. 13.	Eagle No. 27.	Eagle No. 44.	Eagle No. 52.
Eagle No. 2.	Eagle No. 18.	Eagle No. 28.	Eagle No. 45.	Eagle No. 55.
Eagle No. 3.	Eagle No. 19.	Eagle No. 37.	Eagle No. 46.[1]	Eagle No. 56.[1]
Eagle No. 5.	Eagle No. 24.	Eagle No. 41.	Eagle No. 48.	Eagle No. 59.
Eagle No. 9.	Eagle No. 26.	Eagle No. 42.	Eagle No. 50.	

SUBMARINES OUT OF COMMISSION.

U-117 [2]	Philadelphia.	UC-97 [2]	Chicago.
U-140 [2]	Do.	UB-88 [2]	San Pedro.
UB-148 [2]	Do.	U-111 [2]	Portsmouth.
G-1 [3].			

SUBMARINES AND SUBMARINE TENDERS IN RESERVE.

D-1, 2, 3 [4]	New London.	K-1, 2, 3, 4, 5, 6, 7, 8 [5]	Philadelphia.
Eagle No. 33	Do.	E-1, 2	Hampton Roads.
Fulton	Do.	Eagle No. 17	Do.
G-3 [4]	Do.	L-1, 2, 3, 4, 9, 10, 11	Do.
N-1, 2, 3, 4, 5, 6, 7 [4]	Do.	M-1	Do.
Eagle No. 25	Philadelphia.	F-2, 3 [6]	San Pedro.

SUBMARINES IN ORDINARY.

A-3, 5 [7]	Cavite, P. I.	B-3 [7]	Cavite, P. I.

VESSELS TO BE PLACED OUT OF COMMISSION IN NEAR FUTURE.

Warbler [3]	Philadelphia.	Quiros [8]	Asiatic Station.
Elcano [8]	Asiatic Station.	Samar [8]	Do.
Pampanga [8]	Do.	Villalobos [8]	Do.

REDUCED COMMISSION OR ORDINARY.

Rappahannock [9]	Portsmouth.	Hannibal [9]	Philadelphia.
Chester [9]	Boston.	Comfort [9]	Mare Islnad.
Caesar [9]	Norfolk.		

DESTROYERS OUT OF COMMISSION.

AT PHILADELPHIA.

Ammen.	Henley.	Mayrant.	Paulding.	Terry.
Beale.	Jarvis.	McCall.	Perkins.	Trippe.
Burrows.	Jenkins.	Monaghan.	Roe.	Walke.
Drayton.	Jouett.	Patterson.	Sterrett.	Warrington.
Fanning.				

[1] In full commission.
[2] Being dismantled.
[3] Target for depth-charge experiments.
[4] Submarine school, experimental and development work.
[5] Under repairs.
[6] Elemental submarine school work.
[7] No work being done.
[8] To be sold.
[9] General repairs.

Summary by navy yards of ships under repair.

PORTSMOUTH, N. H.

Paducah	Oct.	15
Colhoun	Indefinite.	
Israel (res.)	Do.	
McKee (res.)	Do.	
Ringgold (res.)	Do.	
Robinson (res.)	Do.	
Stevens	Do.	
Taylor (res.)	Do.	
S-3, 4, 6, 7, 8	Oct.	10
Cormorant	Indefinite.	
Rappahannock (res.)	Do.	
Auk (res.)	Do.	
Curlew (res.)	Do.	
Flamingo (res.)	Do.	
Grebe (res.)	Oct.	15
Osprey (res.)	Indefinite.	
Swan (res.)	Do.	
Woodcock (res.)	Do.	
Patuxent	Do.	
Long Beach	Oct.	1
Eagle, No. 23	Indefinite.	
Eagle, No. 29	Do.	
Eagle, No. 51	Oct.	15
Eagle, No. 54	Sept.	30
Otsego	Indefinite.	
Peacock	Do.	

BOSTON.

Chester (res.)	Indefinite.	
Dolphin	Oct.	1
Case	Indefinite.	
Conyngham (res.)	Do.	
Cowell (res.)	Do.	
Foote (res.)	Do.	
Isherwood	Sept.	25
Kalk (res.)	Indefinite.	
Kimberly (res.)	Do.	
Luce (res.)	Do.	
Maddox (res.)	Do.	
Mahan	Oct.	25
Meredith (res.)	Indefinite.	
Murray	Oct.	25
Pruitt	Indefinite.	
Sharkey	Sept.	24
O-1, 4	Nov.	3
Rainbow	Oct.	9
Savannah	Indefinite.	
Actus	Oct.	9
Black Arrow	Indefinite.	
George Washington	Do.	

NEW YORK.

North Dakota	Oct.	15
Tennessee	Oct.	1
Niagara	Oct.	16
Abbott	Indefinite.	
McDougal (res.)	Do.	
Sampson	Do.	
Tattnall	Do.	
Culgoa	Do.	
Maumee	Do.	
Robin	Do.	
Aramis	Do.	
Nokomis	Do.	
Agamemnon	Do.	
Chautauqua	Do.	
Lake Deval	Do.	

PHILADELPHIA.

Connecticut	Indefinite.	
Kansas	Sept.	27
Louisiana	Indefinite.	
Michigan	Do.	
New Hampshire	Do.	
South Carolina	Do.	
Biddle	Do.	
Breckenridge	Do.	
Cassin	Do.	
Harding	Oct.	9

PHILADELPHIA.

Porter	Indefinite.	
Shaw	Do.	
J. F. Talbot	Do.	
K-1, 2, 3, 4, 5, 6, 7, 8	Do.	
N-4-6	Do.	
S-2	Do.	
Hannibal (res.)	Dec.	15
Henderson	Oct.	2
Hancock	Do.	
Eagle, No. 25	Indefinite.	
Warbler	Do.	
Willet	Do.	

NORFOLK.

A. P. Upshur (fit-out)	Indefinite.	
Benham (res.)	Do.	
Clemson (res.)	Do.	
Connor (res.)	Do.	
Dallas (fit-out)	Do.	
Downes (res.)	Do.	
Duncan (res.)	Do.	
Herndon (fit-out)	Sept.	30
Hulbert (building)	Oct.	8
Hunt (fit-out)	Indefinite.	
Parker (res.)	Do.	
Wm. B. Preston	Oct.	1
Welb. C. Wood (fit-out)	Indefinite.	
AA-1	Do.	
Camden	Nov.	13
Bushnell	Oct.	15
L-9	Indefinite.	
R-1, 2, 3, 4, 5, 6, 7, 8, 9, 10	Nov.	13
Nereus	Oct.	10
Langley	Indefinite.	
Caesar	Do.	
Quincy	Dec.	1
Eagle No. 60	Indefinite.	

CHARLESTON.

Asheville	Sept.	23
Teal	Indefinite.	
Widgeon (res.)	Do.	
Eagle No. 7	Sept.	25

MARE ISLAND.

Birmingham	Oct.	15
Brooklyn	Do.	
Denver	Indefinite.	
Aaron Ward	Oct.	14
Badger	Indefinite.	
Buchanan	Oct.	14
Chauncey	Indefinite.	
Evans	Oct.	14
Philip	Do.	
Thornton	Indefinite.	
Wickes	Oct.	14
Woolsey	Do.	
H-4, 6	Indefinite.	
Comfort (ord.)	Do.	
Glacier	Sept.	30
Ontario	Do.	
Pensacola	Oct.	20

PUGET SOUND.

Mississippi	Oct.	1
Texas	Do.	
Charleston	Nov.	30
Missoula	Indefinite.	
Charlotte	Do.	
Seattle	Do.	
Dent (res.)	Nov.	15
Dorsey (res.)	Nov.	30
Edwards (res.)	Dec.	15
Prairie (tender)	Oct.	15
Rathburne	Nov.	30
Roper (res.)	Nov.	15
Talbot (res.)	Nov.	30
Waters (res.)	Nov.	15
Houston	Dec.	31
Eagle No. 57	Indefinite.	

OFFICE OF NAVAL INTELLIGENCE.
NAVY DEPARTMENT.
Washington, D. C.

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15 NOVEMBER, 1920.

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In general: Bureaus of the Navy Department; all force commanders; all commanding officers of capital ships, the larger patrols, destroyers, submarines, and Navy transports.

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MONTHLY INFORMATION BULLETIN.

NUMBER 11—1920—15 November, 1920.

FOR CONVENIENCE IN ROUTING.

Officer.	Initials.	Date received.	Date forwarded.
Captain			
Executive Officer			
First Lieutenant			
Navigating Officer			
Gunnery Officer			
Communication Officer			
Engineer Officer			
Medical Officer			
Supply Officer			
First Division Officer			
Second Division Officer			
Third Division Officer			
Fourth Division Officer			
Fifth Division Officer			
Marine Officer			

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ORDNANCE.

ANTIAIRCRAFT FIRE.

Source: Lieut. Col. Pagézy.

April, 1920.

Antiaircraft artillery plays to-day, relative to air squadrons, the rôle of coast artillery vis-à-vis sea squadrons.

The coast artillerists pretend, or in bygone days pretended, that "a shore gun is the equivalent of a vessel at sea."

Everyone knows that we, of the antiaircraft service, can not go to this extent and that one surface gun is not sufficient to obtain the upper hand of an airplane in flight.

Is it the fault of antiaircraft artillerists?

Is it the fault of the problem to be solved, which, by reason of its very nature, exceeds the scientific possibilities of the present day?

There is no insoluble problem, you may reply.

Let us admit it, but in so doing I shall venture a remark.

Before being directed to draw up the regulations of antiaircraft artillery and to select for the purpose its apparatus we have persistently endeavored, as have many of you, to prevent the German (boche) guns from dropping shells on our friends and on ourselves.

We have certainly not succeeded.

You have certainly not succeeded.

When bombs fall in the "rear" it would be unfair to forget that shells ("marmittes") are falling at the "front" and that, in both cases, the trench, the subsurface shelter, or . . . the cellar, have saved more people than our guns.

Therefore why do the uninitiated demand so much of the antiaircraft gun? It is the sporting instinct. In shooting, a "good fowling piece" brings down its young partridge at each shot. Is not the problem the same?

Gentlemen, I am first going to show you that the problem is not the same.

I shall then give you an idea of the manner in which it is solved.

I shall terminate with a few words bearing on new guns and mounts which are under trials.

I. The Very Special Nature of the Problem—Its Difficulties.

Partridge shooting; antiaircraft firing:

In both cases the objective to be attained is not the *actual* position which it occupies at the moment of the firing of the shot: we will cal it A_0:

The point to be reached is the position of the objective at the moment when the shot reaches; we will call it the *future position* and we will designate it by A. (See fig. I.)

In both cases, if V is the speed of the objective, and t the time of flight, the distance passed over A_0A has for its length Vt.

Analogous problems: but there is one consideration which completely changes—that is, t, the time of flight.

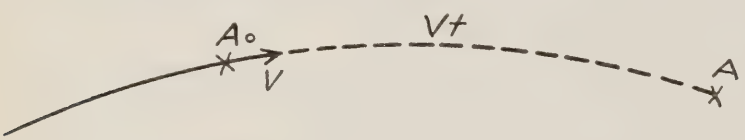


Fig. 1

You fire at a partridge, distant 60 meters—time of flight one-fourth second.

You fire at an aircraft, distant 6 or 7 kilometers—time of flight 20 to 25 seconds.

Rifle shooting is percussive.

Gunfire is time-fuse firing and it is essential to add to the time of flight, properly so called, the 8 seconds necessary for fuse punching, loading, and firing.

Upon the whole, we pass from one-fourth of a second to 30 seconds—120 times greater.

Are we to conclude from this that the firing will simply be 120 times more difficult? I have read this somewhere in a well-known journal under a well-known signature. But let us beware of the rules of three. They are only good for solving the formula $y=Kx$, and I quite believe that this formula is only encountered in nature when we ourselves place it there by virtue of a sort of previous convention.

The real truth is that there exists no common measure between the two problems. They are not of the same nature.

When you propose to yourself to fire at a bird or on an airplane having a time of flight t equal tó one-fourth of a second, even two or three seconds, you find yourself confronted by a problem scientifically soluble. You are nearly certain that your objective will follow a course nearly straight during the time t and you are able to calculate with sufficient exactitude where the said objective will be at the end of this time.

With a time flight of 30 seconds the problem changes completely. In 30 seconds a modern airplane makes 1,500 meters. You will fire, therefore, at a point 1,500 meters ahead of the plane. It is at this point that you arrange a "rendezvous."

If you are very clever and if you fire very accurately, your projectile will arrive on time at the rendezvous. (See fig. 2.)

But the airplane itself—it will either be there or it will not be there.

When the projectile is fuse punched, then fired, you have no longer any control over its destination. You have no magic cord at your disposal enabling you to deflect the projectile from its path and, as it were, say to it, "It is no longer there—the point to which you must go—it is no longer the point at which you must burst."

On the contrary, the aviator is master of his maneuver. You may say that if he presents himself at the rendezvous at the exact moment he is really very good and very "polite."

And then, the astonishing part, is not that the artillerists miss the planes; the astonishing part of it all is that there are often aircrafts which allow themselves to be brought down by the gunners. I shall show you this presently; the statistics are absolutely exact in this respect.

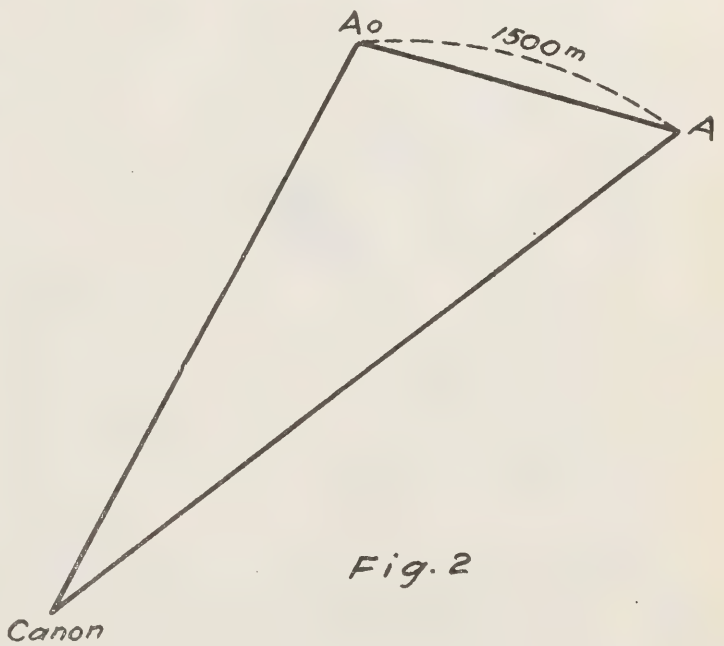


Fig. 2

I beg your indulgence if I attempt to make myself better understood by imparting to my idea an image somewhat paradoxal, a form of a paradoxal theorem, and this theorem, here you have it:

"When a plane is brought down by the gun, there is somewhere a bungler."

It is so, gentlemen, let us reason thus:

I arrange a rendezvous with plane at A, on the prolongation of its course.

Either the plane arrives there and its pilot is really very "bungling," or the plane does not arrive there, and if he is brought down it is because the gunner has not fired at A. The gunner has not fired at the point he desired, and it is he who is the bungler.

Is it possible to get out of this dilemma?

Evidently, you will tell me, we can not know exactly where the plane will go, but we are certain of one thing, and that is that if we describe about A_0 a sphere of sufficient radius—about 1,500 meters for a time of flight equal to 30 seconds, lost time included—the plane

will not get out of it. Whatever may be its evolutions, it retains in general the same speed, so that its path, as irregular as it may be, always leads to some point within the sphere. (See fig. 3.)

Could we not certainly demolish the plane by filling the entire sphere with bursts?

The problem is analogous to that which you propose to yourself when you desire to fire on a battery which is not accurately identified. The actual airplane is seen like "the nose on the face" and it is that which leads us to believe that it is easy to hit it; but what we should see is its future position, and this position is concealed somewhere within an enormous volume. Let us act in the case of terrestrial gunnery. Let us riddle the entire "suspected zone"—a simple affair of ammunition. Let us calculate how much of it we shall need:

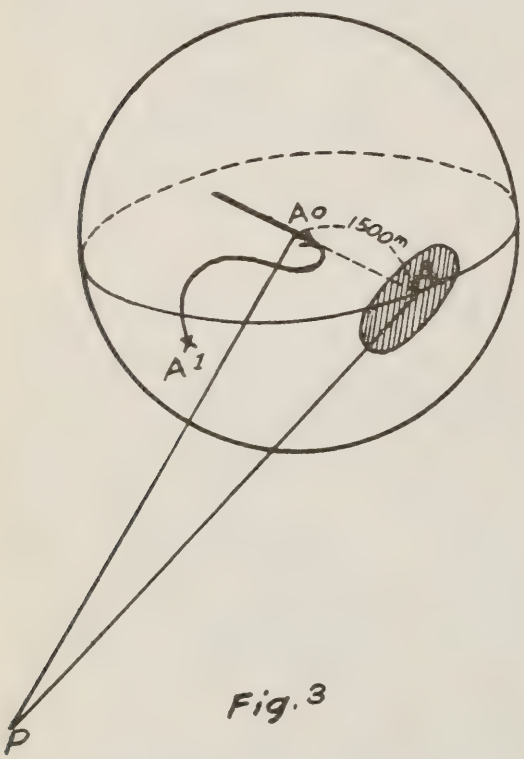


Fig. 3

Volume of the sphere: $\frac{4}{3}\pi R^3$.

R=1,500 meters.

$\frac{4}{3}\pi R^3 = 14 \times 10^9$ (about)

or *14 billion* of cubic meters.

The dangerous volume of the shell:

It is very difficult to evaluate (for shrapnels, it depends very much on the remaining velocity, i. e., on the altitude and on the distance). Some base on an average of 5,000 cubic meters, others on 10,000 cubic meters, others on 20,000 cubic meters.

Let us take 10,000, or 10^4. To fill the sphere we should require 1,400,000 shells.

Assuming 20,000, to fill the sphere, we should still require 700,000 shells.

We reach an impossibility.

On the whole, we have the choice between two solutions:

Either make no hypothesis and fire at random into the sphere of possible positions.

According to what I have just told you our chances of hitting would be so small that we had better "fold our arms."

Or assume that the airplane is not there to perform acrobatics, that it has a mission, that this mission exacts a certain sort of a track:

Assume a reasonable hypothesis respecting this track:

Deduce from it the future position A;

Send a group of as many shots as possible into the region of this future position;

And leave our chances of hitting rather to the mercy of the aviator's maneuvers.

This solution is the only one. We have adopted it. We have now only to allow the aviators to speak, on the one hand, and on the other the statistics, and to ask them if the results obtained would justify the continuance of antiaircraft artillery.

Interrogate the aviators. They will tell you, all of them, that the enemy's artillery constitutes a considerable inconvenience for them. A pilot can not, however, always think of the guns pointed along the prolongation of his course and which open fire suddenly, without a warning cry. If he thinks of this he is preoccupied; if he is preoccupied he observes less accurately. The first few shots of a firing are particularly disagreeable for him. You will tell me that this opinion has only relation to the manner of firing of our enemy. But, gentlemen, since the armistice, we know positively their methods and their apparatus. The Germans fired in 1918 as we, ourselves, fired in 1916. They were two years behind.

Let us consult now the statistics. They will unfortunately not inform us how many airplanes have badly fulfilled their mission through avoiding a fire directed at them; the statistics will at least tell us, I do not say how many airplanes have been brought down, but how many airplanes have been acknowledged as brought down.

I speak from their dictation:

In 1914 and 1915—very few planes brought down; no statistics.

In 1916—60 planes brought down—percentage not well known; very probably in the neighborhood of 1/11,000.

In 1917—120 planes brought down. Percentage: 1/11,000 (about).

In 1918—220 planes brought down. Percentage 1/7,700 (about).

Let us examine more particularly the 1918 statistics.

If instead of considering the ordnance material as a whole we only take into consideration the automatic gun, which alone had a complete modern apparatus; if instead of considering the shells as a whole we only take cognizance of the explosive shell; if in place of considering firing as a whole we only consider day firing—we find a percentage of 1/3,227 (the percentage of *day* firing of the *platform* mounted gun with *explosive* shell is 1/5,741).

Contrary to the formula, statistics never escape commentary.

From 1916 to 1918 the percentage went from 1/11,000 to 1/7,700.

Concerning more particularly the automatic gun and the explosive shell, it fell to a figure we should never have believed possible—1/3,200.

Now, what is it that distinguishes 1918 from 1917, 1917 from 1916, 1916 from 1915? What is it that distinguishes them from the point of view of the airplane? What is it that distinguishes these years from the artillery point of view?

From the airplane point of view three elements are modified—the speed, the altitude, and the facility of movement.

Their *speed* has increased from 30 meters per second in 1915 to 50 meters per second in 1918. The radius of the sphere of the possible positions has therefore increased from 900 meters to 1,500 meters. Its volume has become more than four times greater. From this single fact fire has become something like four times more difficult.

The customary *altitude* of airplanes was 2,500 meters in 1915. The maximum altitude was 4,000. Beginning with 1917, altitudes of 5,000, 5,500, then 6,000 have become very frequent. We did not have the shell Model 1917 at our disposal. We only had shrapnel and explosive shells Model 1900. The zone of action of the 1900 shell is insignificant—about 4,000 meters. We were therefore obliged to fire shrapnel. Now, shrapnel are of no value at high altitudes: their remaining velocity becomes too reduced: their cone of burst is nothing but a cone of "confetti" without any serious material effect.

The *facility of movement* has greatly increased. The airplanes have profited by it to an increasing extent for their defense.

From the gunner's point of view:

1916 was the year of the invention, or at least the perfection of the greater part of the present firing apparatus.

1917 was the year in which the apparatus conceived in 1916 was distributed to the various units, also the year of final adjustment of methods, and the utilization of the remarkable works of the "sages" of Gavre, of whom the ordnance engineer Garnier, has come here with a view to entertaining you.

1918 was the year of the "harvest." Since the instructions respecting fire, dated 1st October, 1917, the regulation methods have no longer been subject to discussion. Most officers have faith in them and apply them even when their chiefs' backs are turned. 1918 was likewise the year of the improvement of night fire, which became more effective with a hitting percentage of one airplane to 4,000 shots (instead of 11,000 to 12,000 for day firing). Gross percentage for automatic guns and platform mounts taken as a whole. It is essential to add that automatic guns have only been authorized to fire explosive shells since the summer of 1917. Previous to this date these shells had not proved very efficacious, which was due in part to the fact that the curves engraved on the range drums and plates

employed were very inaccurate. On the whole, the high command had concluded that it could not authorize the automatic guns to fire them without signing their death warrant. The number of guns destroyed by self-bursting would have been greater than the number of guns it would have been possible to construct.

However that may be, from 1916 to 1918 there was an evolution constantly along the same line.

The fire was becoming more and more scientific.

The difficulties are multiplied by 6 or 7, but the percentage is not divided by 6 or 7—it is maintained or improved. By using a proper shell one plane is brought down in 4,000 shots.

What other conclusion than that rational firing is infinitely preferable to firing at random?

I summarize.

Antiaircraft fire is fire of a quite special nature. It is a sort of game, like roulette.

The squares of our roulette table constitute the various pieces of an enormous sphere, and when one places his stake at random on one of these squares the chances of striking it are extremely small, something like 1/700,000.

But the antiaircraft gunners have at their disposal scientific methods and apparatus which enable them to discover, for each salvo, one marvelous square into which they constantly fire. This method of operating procures for them extraordinary benefits: 400 aircraft brought down since 1916, as against five or six which would have been destroyed without it.

We are gamblers who have discovered a magical doubling system (martingale)[1] which insures success instead of ruin.

As a general rule, and except when the plane turns at the very moment its direction of flight is determined, this double system consists in prolonging the route of the plane in a straight line, by a vector A_0A equal to Vt, to fire in the region of A with an approximation of 100 or 200 meters, and to be resigned when shots are lost due to a change of the plane's flight.

I now propose to give you an idea of the manner we apply this "martingale."

II. Firing Methods of Antiaircraft Artillery.

Two problems present themselves (see fig. 4):

Determine A.

Fire on A as on a fixed target.

Let us first examine the second problem.

[1] NOTE BY TRANSLATOR.—"*Martingale,*" in figurative language, conveys the idea of doubling losses (v. Littre and Larousse). In gambling terminology, where it is constantly used, it is generally a doubling system, but may refer to any "system" which is being practiced. The gamblers are not entirely in accord.

(A) Firing on an Aerial Target Supposed to Be Fixed.

Aerial targets differ from elevated targets on which all guns should be able to fire on account of the great value which the angle of elevation may assume. Hence, two cases arise:

(1) The trajectory is considerably distorted (déformé);

(2) The distance remaining the same, the hole to be punched in the fuse varies.

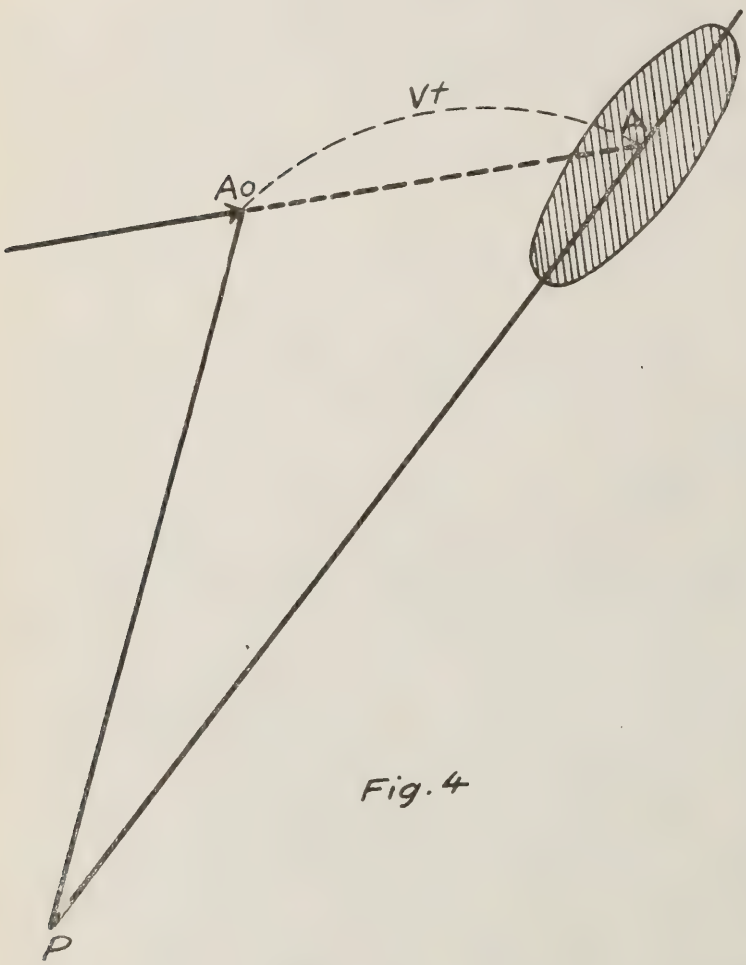


Fig. 4

(1) *Deformation of the trajectory.*—You will say that you all know how this is taken into account.

You take a small multicolor book which is called the Range Table.

Table I gives the angle of elevation.

Table II gives the complementary correction for elevation.

Table V gives the angle of fire.

The sum of these three values is taken, which gives the "angle of elevation," which we also call "inclination of gun."

This is one solution.

It has one inconvenience; this "fixed" target on which we propose to fire is a fugitive airplane, which changes with every shot. While we are consulting our tables and while we are making our additions the plane continues its flight.

A more expeditious process was necessary. This process was found as far back as 1907, and is due to Gen. Sainte-Claire Deville. It is the method known as "elevation curve disk."

The method is as follows:

The angle of elevation is obtained by pointing on A. What we want is the angle of elevation B (angle de hausse). (See fig. 5.)

This angle B depends on the position of A in the plane of fire.

It is a function of the two coordinates which define this position—for example, distance D and elevation *s*—we can therefore write:

$$(1)\ B=f_1\ (s, D).$$

We can use either variable. We can say that the point A is determined when we know the trajectory, i. e., the inclination of the gun *i*, and the fuse punch, or distance marked on the fuse-setter B (we call it fuse-setter distance).

We can therefore write:

$$(2)\ B=f_2\ (i, B).$$

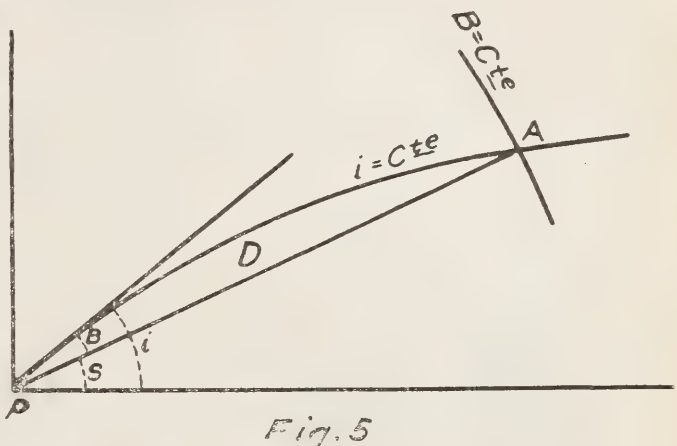


Fig. 5

The elevation curve disk is an instrument which mechanically solves formula 2.

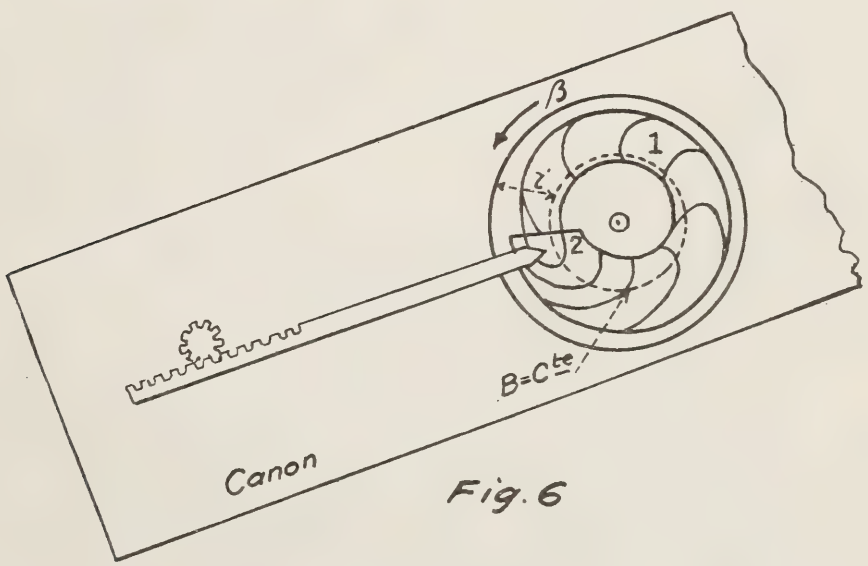


Fig. 6

It is composed—

Of a plate 1, which replaces the "sight drum" of the 75-mm. field gun, and which, like it, turns in proportion to B. (See fig. 6.)

Of an index 2 connected to the gun by a gear and which moves automatically along the radius of the plate in proportion to the inclination *i*.

To each valve of i there corresponds a definite position of the index, which on the plate corresponds to a certain circle—i being determined, B now depends only on B (formula 2), so that we can trace a graduation as a function B on the circle, i=constant. By repeating the same operation for every one of the circles i=constant and tracing a curve to connect all the points corresponding to the same B, we obtain a system of curves marked 2000, 2100 . . . 3000 . . .

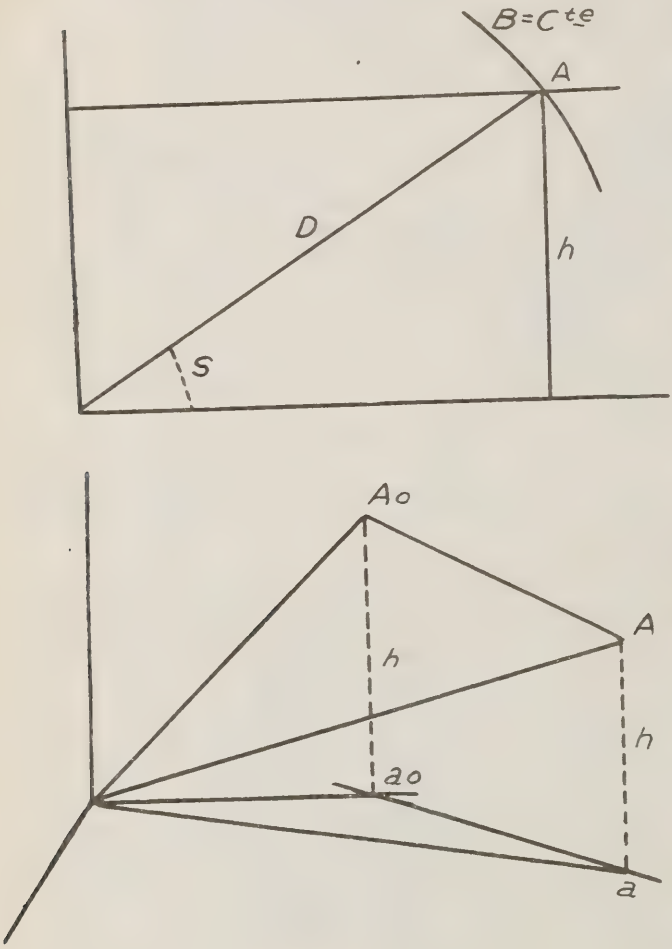


Fig. 7

In order to obtain the elevation 3000, it suffices to turn the sight crank so as to bring index 2 on the curve 3000. The index automatically assumes the required elongation, which renders the operation as simple as that of sighting the 75-mm. field gun.

The replacing of variables s and D by variables i and B is due to the following reason:

It is easier to connect index 2 to the gun, which turns as a function of i, than to connect it to the cradle, which turns as a function of s. We have therefore replaced the variable s by variable i.

When distance is ordered, this distance interests both the gunner and the fuse-setter operator. It is therefore easy to replace the element "geometrical distance" by the element "fuse-setter distance" or "fuse punch." It is a means of economizing one variable.

(2) *Problem of fuse punching.*—Both the fuse-setter and the gunner must know B.

For land firing, we consider that B is only dependent upon the distance.

For aerial firing, B depends on the distance and on the site, or, more generally, on the two coordinates which define the position of A in the plane of fire. (See fig. 7.)

A is a "future" position. The flight of the plane being in general practically horizontal, the altitude of A is generally the same as that of A_0.

By taking as variable the altitude and not the distance, the problem we shall have to solve presently, i. e., the passage from the present to the future position, is considerably simplified.

We shall therefore write:

$$B=f(h,s)$$

f being an empirical function given by the Gavre elevation curves.

In order to determine B, we shall use an instrument analogous to the elevation curve disk (hausse-abaque), which is called the "altitude telemeter" because it changes the altitude into a distance (fuse-setter distance). (See fig. 8.)

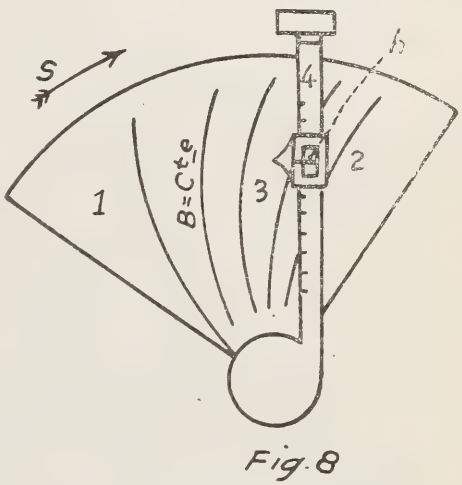


Fig. 8

The altitude telemeter is generally placed directly on the gun (fig. 8).

1 is a plate fixed on the left trunnion of the cradle. When the elevation of A is given to the cradle, the plate 1 is caused to turn through an angle equal to s.

2 is a slide which traverses an alidade 4, permanently fixed to the mount and graduated in altitude.

The slide 2 bears an index pointer 3.

It may be considered that s and h are the coordinates of the point on the plate which corresponds to 3. We may therefor trace on the plate a system of curves B=constant. These curves once traced, we can read the value of B directly under the pointer S.

The preceding presupposes that the altitude is known.

We determine it by means of an apparatus called an altimeter.

Notions Concerning Altimeters.

Most altimeters are based on what is termed the "roof principle."

By means of two planes of sight, turning about two "hinges," parallel and horizontal, PP′, OO′, we form a sort of "roof" the ridge of which points to the airplanes. (See fig. 9.)

The base b (distance between the hinges) and the two angles at the base W_1, W_2 are measured. From these measurements we deduce the altitude of the ridge, i. e., the altitude of the airplane.

(B) Passing from the Actual to the Future Position.

According to what has just been stated, we may fire on any aerial target A, provided we know the following:

Its direction, i. e., its azimuth;

Its elevation, elevation to give the cradle,

and its altitude.

The elevation curve disk and the altitude telemeter look out for the remainder of the operation.

We have seen that the future altitude can generally be assumed as coinciding with the present altitude and we know how the present altitude is measured.

There remains to be considered the two problems of the azimuth and the elevation.

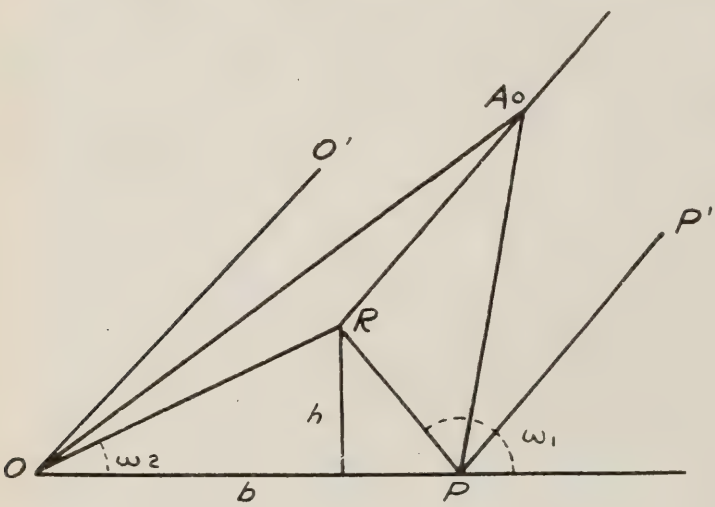


Fig. 9

I invited your attention, a few moments ago, to the fact that the point A is a point concealed somewhere in a larger sphere.

When you desire to hit a target not visible from the gun, you assume an "aiming point."

We proceed just as you do, but we generally chose for aiming point the airplane seen by everybody, the airplane in its actual position. It is an old practice. It is what we call direct firing. Furthermore, we now have at our disposal instruments which, the case arising, enable us to assume a fixed aiming point, North Lambert for instance. This is what we call indirect firing.

Let us speak about direct firing.

We aim at A_o, but with a view to reaching A.

I shall not be teaching you anything new if I say that two corrections are to be made:

Correction for lateral deflection;

Correction for elevation.

The whole idea consists in determining these two corrections. For this we dispose of two principal methods—the "orientation" method (angle of approach) and the "tachymetric" method.

Orientation method.—Let us consider, for instance, the correction for lateral deflection in the case of the automatic gun—a correction

which is given by causing the aiming apparatus to turn around a vertical axis and which is recorded in true magnitude in the horizontal plane, whence the name "deflection allowance in the horizontal plane" ("derive dans le plan horizontal"). It is designated by δ_h, and we shall show that it is given by the formula (see fig. 10):

$$\text{Sin } \delta_h = \frac{Vt}{D \cos s} \sin \alpha_o$$

where:

V is the speed.

t, the interval of flight.

D, the future distance.

s, the future site.

α_o, the actual orientation or angle formed by the vertical plane of sight with the vertical plane containing the fuselage (fig. 10).

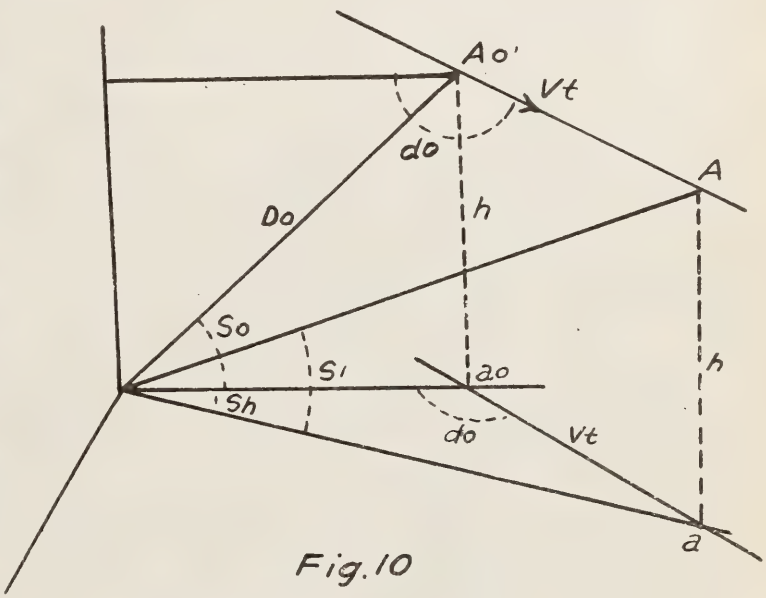


Fig. 10

This formula appears to contain five variables, but in reality t is a function of h and B, since h and B determine A; D and s are also functions of h and B. So that we may write:

$$(1)\quad \text{Sin } \delta_h = V f\ (h, B) \sin \alpha_o.$$

We already know h and B (variables of position). We must know, in addition:

How to determine V;

How to determine α_o,

and to solve the formula. (See fig. 11.)

Determination of "variables of movement" V and. α_o.—We can determine V and α_o by means of two instruments which were constructed in 1916 by the Arnouville School and which are termed the "altitude techyscope" and the "angle of approach telescope" ("lunette d'orientation").

These instruments, however, are not absolutely necessary.

The wind being at first supposed nil (we shall see further on how it is taken into consideration), V is a sort of an "invariant" of firing which depends chiefly on the model. All our officers know that, under such or such circumstances, a particular model has such or such a speed. They are generally not far wrong.

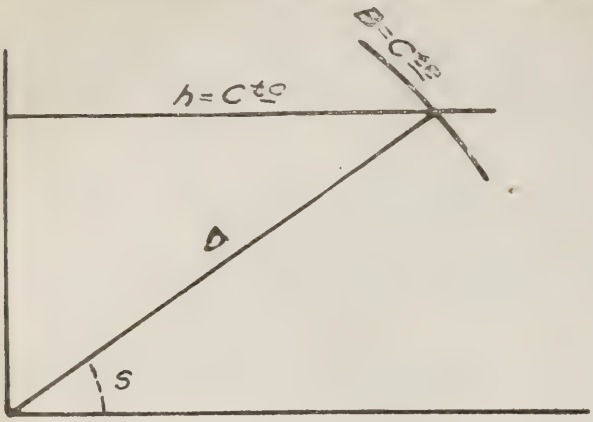


Fig. 11

α_0 is an element which our officers and our pointers come to know instinctively.

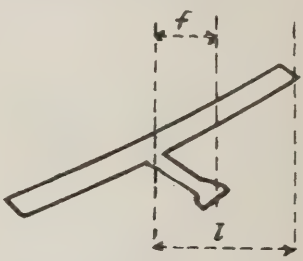
We perceive immediately whether the airplane is coming or going.

If it is going toward the right, we say it is coming or going *minus*.

If it is going toward the left, we say it is coming or going *plus*.

On the other hand, we examine how the tail projects over the wing and we arrive, by means of some very simple rules, to determine the angle of approach in multiples of 15° (with an approximation of 7 or 8°).

It is said that an airplane comes +30 (fig. 12) or goes —45 (fig. 13).

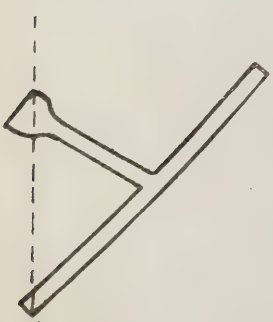


Vient +30 $\frac{f}{l} = \frac{1}{2}$ environ

Fig. 12

Solution of formula (1).—If δ_h depended only on two variables we could obtain same, just as we obtained the angle of sight and the fuse-setter distance, by means of a curve (abacus traced upon a surface).

But there are four variables and it seems at first sight that the problem is a problem of four dimensions which is solvable by analysis, but can not be solved mechanically or geometrically.



Va -45

Fig. 13

This would be true if variables V, h, B, α_0 were mixed up. But they are completely separated, or in groups of two, so that formula (1) may be solved by a combination of abaci (curves).

I shall make myself better understood by immediately describing the mechanical calculator which we have been led to construct in March, 1916, and which is called the goniograph.

We desire the telescope to turn through an angle equal to δ_h. This telescope L, causes the slide, by means of a slot and hook, to move along a horizontal rule 2 (fig. 14).

The figure shows that 1 moves proportionally to tan δ_h.

It is a question of arresting the displacement of the telescope at the moment tan δ_h assumes the required value. To this end the slide 1 (fig. 15) carries an index 3, which moves along a generatrix to the cylinder C.

This cylinder may turn around its own axis and has inscribed on it a system of curves of orientation marked: 0, $\pm 15°$, $\pm 30°$, etc.

The movement of the telescope is arrested when index 3 is on the desired curve. The rotation imparted to the cylinder and the tracing of the curves of the system should be regulated in such a manner that the displacement of 3 be equal to tan δ_h.

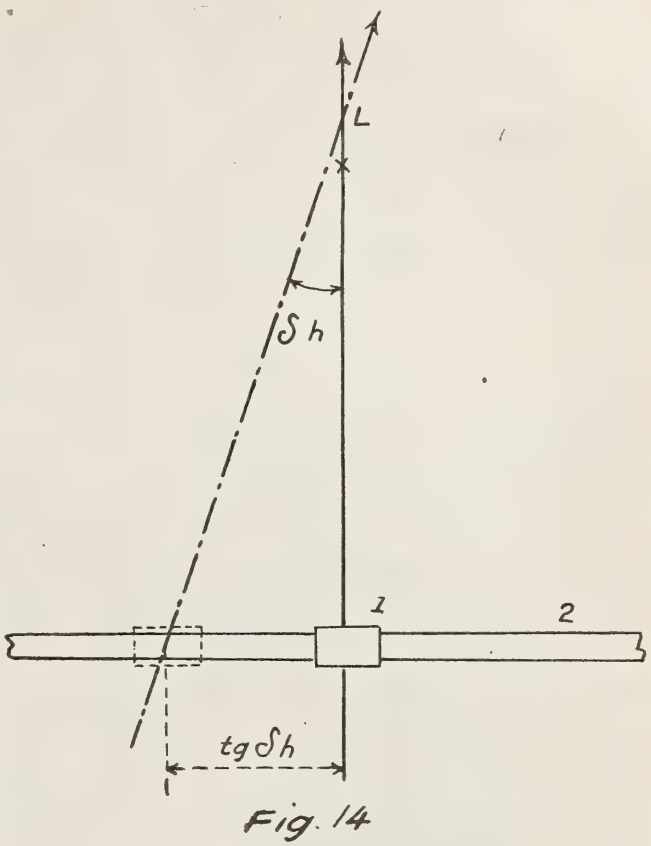


Fig. 14

Let us again consider the formula:

$$\text{Sin } \delta_h = V f\,(h,\ B) \sin \alpha_o.$$

Let us consider the product $Vf\ (h,\ B)$ as a whole, calling same z:

$$z = Vf\,(h, B).$$

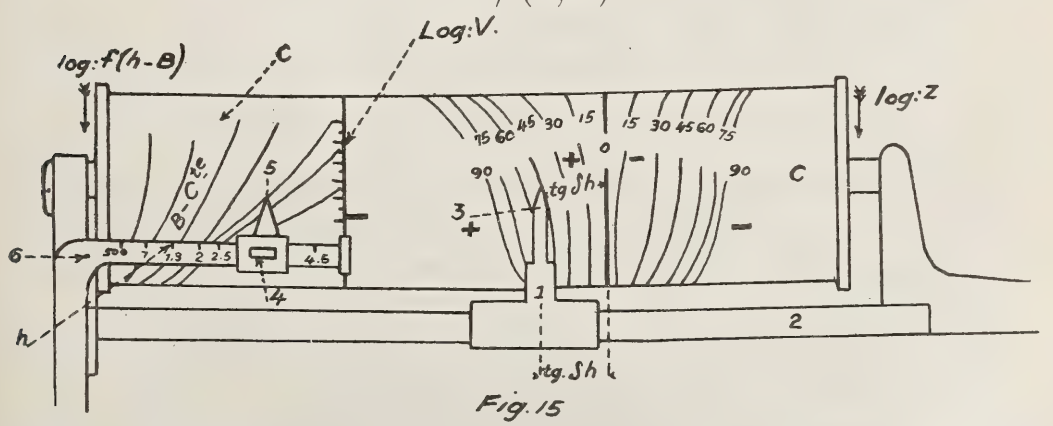


Fig. 15

Let us assume that z is known and that the cylinder C is caused to turn according to a function of z,

Sin $\delta_h = z \sin \alpha_o$ depends only on *two* variables, z and α_o. Tan δ_h likewise depends only on z and α_o. For a definite position of the

cylinder, i. e., for a definite value of z, it only depends on α_o, so that on the generatrix corresponding to index 3, there can be traced a graduation in α_o. By repeating the same operation for all the values of z and connecting by means of curves all the points of same value we shall have traced on C the system of curves which has been mentioned above, and which gives tan δ_h.

It now remains to cause C to turn as a function of z.

$z=Vf\ (h, B)$ being a product, we choose for the function its logarithm. This logarithm is written:

$$\text{Log } z=\log V+\log F\ (h, B),$$

that is, we obtain it by adding log V to log f (h, B). To this end the cylinder C is prolonged by another smaller cylinder c (fig. 15).

Each cylinder is actuated by the other through friction, but we can displace them relative to each other by securing one of them in a fixed position. In order to cause C to turn by an amount equal to log z, it suffices to make c turn by an amount equal to log f (h, B) and to cause C to turn relative to c by an amount equal to log V.

Log f (h, B), a function of two variables, will be obtained by means of the system of curves.

4 is a slide having a pointer 5, which moves along a rule 6, graduated for altitude.

c carries a system of curves in B. The altitude being marked the desired position is imparted to c by causing it to turn so as to bring the curve corresponding to the momentary B directly under the point 5.

This displacement of C relative to c is obtained by means of a reference mark traced on C and of a graduation in log V traced on the right edge of c.

Let us resume. In order to obtain tan δ_h it is necessary—

To give the altitude to the slide 4.

To note the speed by displacing C relative to c.

These two elements are those which vary least during the course of firing.

When these are given the cylinder c is displaced with one hand in such a way as to bring the curve in B directly under 5; the other hand displaced the telescope so as to bring 3 on the orientation curve commanded.

Wind corrections are given by a movement of the slide 1 relative to the telescope.

The element which exerts the greatest influence over the corrections, the element which must permanently be kept up to date, is the orientation element, whence the name "goniograph": inscription of angles.

Let us remark in passing that the applications of this goniograph are not limited to antiaircraft fire. It is susceptible of solving all the formulæ of the following form:

$$(2)\quad z=f(x_1)\ \varphi(x_2), \qquad \psi(x_3, x_4)+\chi(x_5),$$

and to give their results in true magnitude, i. e., the goniograph can be employed for imparting a displacement exactly=to Z to a clamping device of an apparatus.

Tachometric method.—Suppose that we are measuring the speed of rotation of the vertical plane of sight of any instrument aimed at the airplane. Let us admit that this speed is 5 mils and that the duration of the trajectory is 20 seconds.

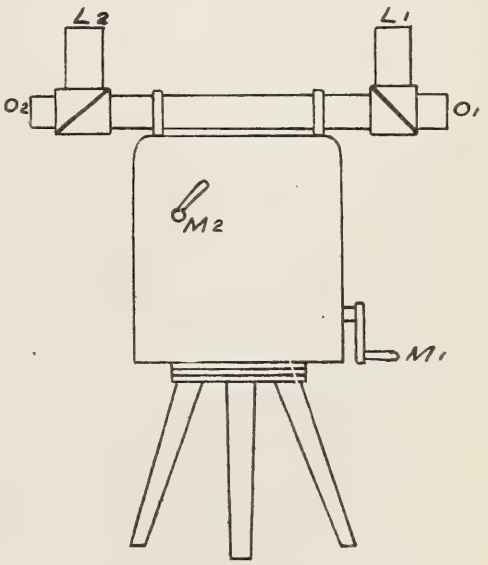


Fig. 16

We say: In one second the vertical plane of sight turns an amount equal to 5 mils; in 20 seconds it turns an amount equal to $5\times20=100$ mils. The correction for lateral deflection is equal to 100 mils.

In a general manner, we obtain δ_h by multiplying the angular speed in azimuth ω_d by the duration of trajectory t.

We obtain likewise the correction for sight by multiplying by t the angular speed in sight ω_s.

This reasoning is that of "the rule of three."

The reasoning assumes that the angular speeds will remain constant during the entire duration of trajectory. In reality, when the airplane follows a straight direction the angular speeds vary too much to permit of neglecting them. This is what complicates somewhat the tachometric method. The products $\omega_d t$, $\omega_s t$, none the less, represent the *principal part* of the corrections. Let us see how they are obtained, taking for example the electrical tachometers of the auto-cannon (Brocq tachometer).

We follow the airplane in azimuth and in elevation by means of two elbow telescopes, L_1, L_2, secured on the same horizontal axis, and two crank handles M_1, M_2 (figs. 16 and 17).

The crank M_1 causes the system of two telescopes to turn about a vertical axis (pointing in azimuth). The crank M_2 causes them to turn about their horizontal axis (pointing in altitude).

Suppose it is required to obtain the correction for the lateral deflection:

The crank M_1 is connected by gearing to a small magneto which supplies a current proportional to his velocity of rotation, i. e., proportional to ω_d. This current flows into a circular rheostat R.

The difference of potential which exists between a fixed point of the rheostat A and the point of contact B of the movable contact lever OB is measured by means of a voltmeter V.

The arc AB is caused to vary proportionally to the time of flight t.

The difference of potential measured is proportional, on the one hand, to the intensity of the current which enters the rheostat, i. e., to ω_d; on the other hand, to the length of the arc AB, i. e., to t; it is therefore proportional to $\omega_d t$.[2] The voltmeter, consequently, can be graduated in values of $\omega_d t$ and the principal part of the correction read off directly.

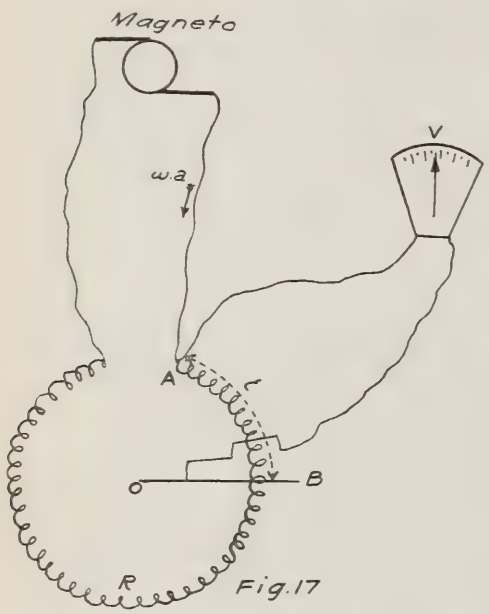


Fig. 17

On the auto-cannon we pass from approximate corrections, $\sigma_1 = \omega_d t$, $\sigma_1 = \omega_s t$, given by Brocq tachometers, to the exact corrections S_h and h by means of a combination of curves which we have had traced on the cylinders of the goniograph, whence the name goniotachometer, given to the apparatus as a whole.

The formulæ which permit passing from $\delta_1\sigma_1$ to $\delta_h\sigma_h$ are somewhat complicated. In order to give them a form facilitating their solution by curves it was necessary to develop them in series and neglect the terms of a certain order of minuteness, which enables us to write:

$$\delta_h = \delta_1 \ (1 + a\sigma_1 + b\sigma_1^2),$$
$$\sigma_h = \sigma_1 \ (1 + c\sigma_1).$$

in which a and b can be considered as functions of h, and c as a function of s. These formulæ are of the form (2). Their exactness is more than sufficient.

(C) The Problem of the Wind.

Problem of ballistic corrections.—The wind and ballistic corrections change when the airplane moves. We are therefore obliged to avail ourselves of apparatus or practical rules which will give these corrections almost instantaneously.

---

[2] In assuming that the conductance of the volmeter is negligible relative to that of the rheostat. In reality it is not negligible. It is accounted for by causing the arc AB to vary according to a function of t, which is easily calculated.

We have not been able to solve these problems: we have only been able to solve satisfactorily the difficult question of variable wind at an altitude, thanks to the labors of the Gavre Commission. I should not remain within the scope of this conference if I were to explain to you all that has been done on this subject, but I desire here to testify how much is due to the officers who composed this commission.

(D) The Question of Adjustment.

I can not likewise go into details on the question of adjustment. I shall merely tell you this:

Antiaircraft firing is a gamble. We "bet" on a certain position "A". If the airplane does not arrive there, if it arrives A_1, we shall note a distance between the bursts and the airplane. Is this a reason to change our manner of playing and to displace all the shots along a vector distance equal to AA_1?

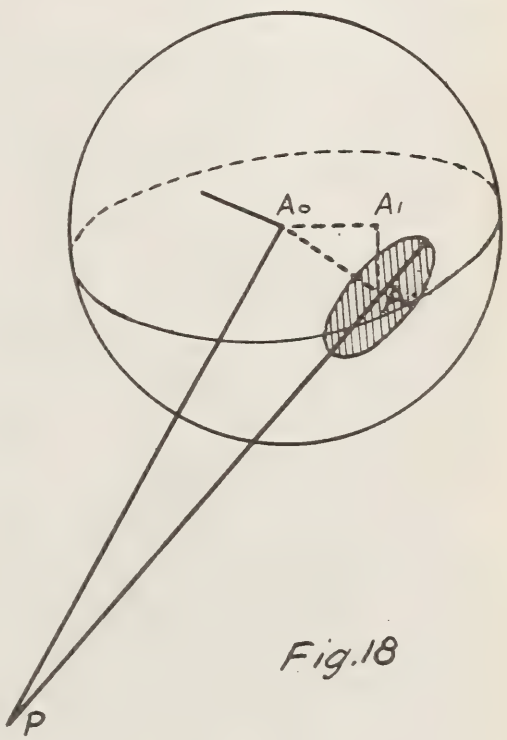


Fig. 18

No, evidently not. According to the laws of chance, the past has no influence over the future. When we possess a good "doubling system" we should follow it to the end without bothering ourselves about temporary losses, which are to be anticipated. Hence, a conclusion which we have placed in "exergue" in our regulations: "Firing against airplanes is not adjusted; it is prepared." Every effort is made in order that the first shots, those which will surprise the aviator, may be as carefully adjusted as possible. (See fig. 18.)

"One does not adjust: one prepares." This formula, which has been imposed upon us with a particular strength, little by little, imposes itself to all gunnery and tends to replace the old formula: "We fire, then observe results."

It exacts more science and more apparatus, but, as to that, so much the worse for our theories prior to the war. We always believed ourselves too advanced in scientific topics; we always believed we had too many machines; the war had demonstrated that our science was not sufficient and that we had not enough apparatus. The time will come, undoubtedly, when all artillerists will be able to calculate beforehand and with certainty all the firing elements, and when, without warning, they will be able to con-

centrate at any time of day or night, on any target, the fire of any number of guns.

(E) Night Firing.

What is to be done in the case of an airplane which can be heard, but which the projectors do not succeed in illuminating?

Should one fold one's arms? Neither soldiers nor civilians who are being bombarded will agree to such inaction. Create a barrage? To stretch an impassable curtain 2 to 4 kilometers in height, all around a town like Paris, it would necessitate about two million guns firing with utmost rapidity.

There remains to us only one more resource, namely, to utilize that vague element—the direction of sound.

The naked ear gives a first idea of it. We have tried to obtain a better result with listening apparatus. Up to the end of 1917 the instruments tried did not give very good results.

As far back as 1917 we successively witnessed the appearance of the "Baillaud parabloid," then a few months later the "Perrin telesitemeter," which are excellent instruments, having a range of 7 to 8 kilometers and giving the direction of sound with a probable error not exceeding 2 or 3 degrees.

Since that time it became interesting to replace "firing by judgment," which was the only method compatible with the lack of precision of data, by a really scientific method.

The naked ear or a listening apparatus informs us the direction of the airplane at the moment it produced the sound which has reached our ear. But sound is a lazy vibration. It takes three seconds to travel 1 kilometer. The listening apparatus only gives information concerning an "airplane passed" and we have to fire on the "future airplane." These two airplanes, A′ and A, are separated by a vector 2 and 3 kilometers in length. How can we pass from the one to the other? Suppose, however, that the listening apparatus could give us the angle of approach (orientation) of the airplane, just as our eyes give it during the day. (See fig. 19.)

The question was completely renovated in December, 1917, by the appearance of a new method which we have called the method of cotangents. Roughly, it consists of the following:

What hinders us is that we are ignorant of the direction of flight of the "passed airplane." (See figs. 20 and 21.)

If we could trace its route on a map, we should know the same immediately. For this, we should have to know at each moment its azimuth φ and its horizontal distance Δ.

The listening apparatus gives the azimuth φ and the site s. It does not give us Δ.

But Δ is connected to s by the relation: $\Delta = h$ cotan s (fig. 21). We therefore know the ratio: $\Delta =$ cotan s.

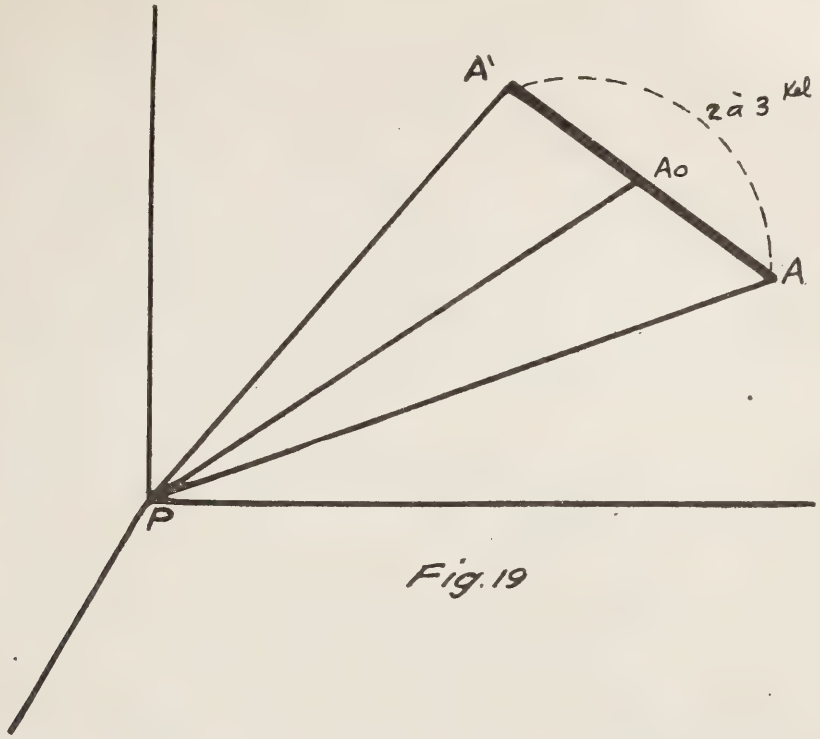


Fig. 19

As it is impossible to consider the altitude as being practically constant, the point a' which has for its polar coordinates φ and cotan $s = \frac{\Delta}{h}$ **(fig. 20) describes a course r parallel to the route R which gives the direction of flight of the airplane. This solves the problem.**

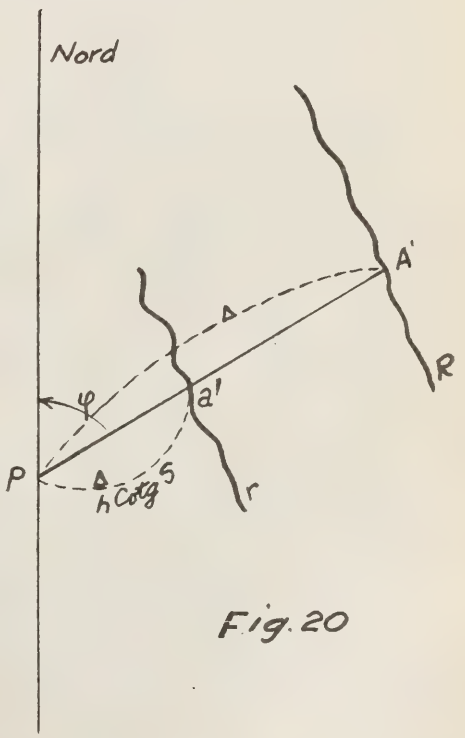


Fig. 20

In practice we proceed in the following manner:

A graph is prepared in advance; it is composed of radiating straight lines graduated for azimuth and of circles marked 80°, 70°, **60°, etc., having for radii cotan 80, cotan 70, etc. (fig. 22).**

The azimuth and elevations of successive passed positions of the airplane are read at regular intervals on the listening apparatus; to each reading there corresponds a point on the graph. All these points are connected by a curve. This curve represents the *route of the airplane at a scale of* $\frac{1}{h}$. (See fig. 22.)

Everything can be deduced from the route r.

1. We have already said that it gives the *angle of approach of the flight.*

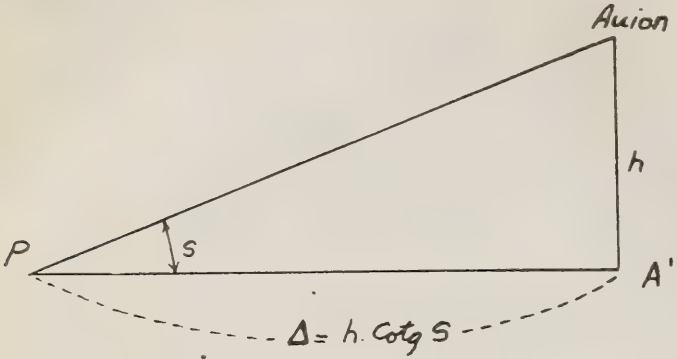


Fig. 21

2. The scale of the route r becomes smaller in the same proportion as h becomes greater.

The greater the altitude the longer it takes the airplane to cover the route. The speed of the airplane being practically known, the altitude can be determined by measuring the speed with which the point a' covers the route r.

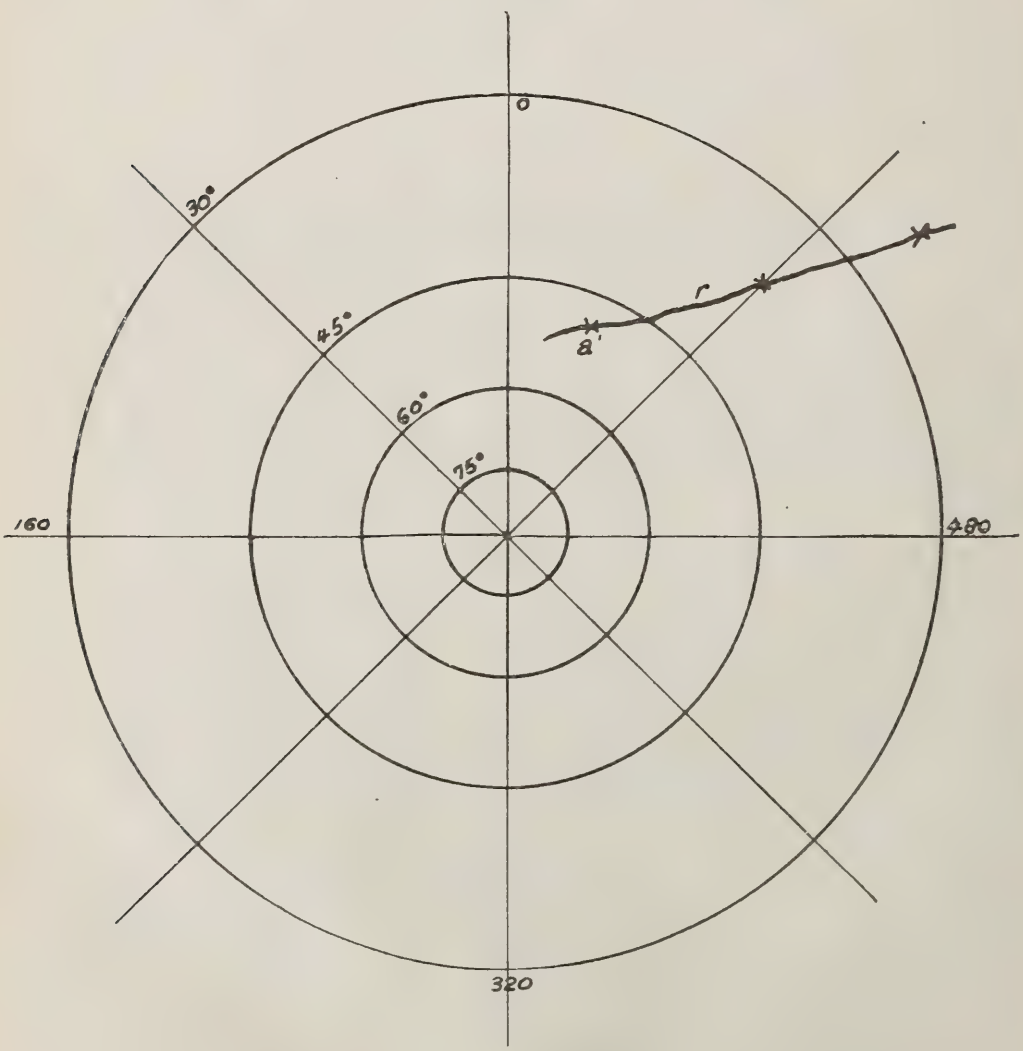


Fig. 22

3. We may extrapolate the route and obtain by means of very simple rules either the future azimuth and the future site which

are appropriate to the firing or the actual azimuth and site which are appropriate to a projector.

It results therefrom that the cotagent method has facilitated both firing by sound and the operation of the projectors.

For more detailed information see the "Instruction on firing by sound," of February 25, 1918.

III. Guns and Mounts.

We have the 75 on automobile carriage, the 75 on trailer, the 75 on platform. But they are all 75-mm. guns.

This gun has some most excellent qualities—in particular that of being perfected in so far as concerns aiming apparatus—this since 1916—and of being perfected as follows, in so far as matériel, properly so called, is concerned:

Since 1914 for automatic guns.
Since 1915 for platform mount.
Since 1917 for trailer gun.

To actually exist is something in favor of a gun.

But objections have always been raised relative to the time of flight of its projectiles; 20 seconds at 6,000 meters. It must not be forgotten that the volume of the great sphere, to which we must always refer, is proportional to the cube of $(t+\theta)$, t being the time of flight and θ the dead time.

If it were possible to divide $(t+\theta)$ by 2, we should divide by 8 the number of "compartments of the sphere" which apply "to the banker," not to us.

Fault has always been found with the 75-mm. gun by reason of the small efficiency of its shell. from 10 to 20,000 meters being the dangerous volume.

Since 1916 fault is found more particularly with the 75-mm. gun for having an insignificant zone of action: From 4,000 meters altitude for explosive shell of 1900, and from 5,000 or 5,500 meters altitude for 1917 shell. Here I do not refer to shrapnel. I have already called your attention to the fact that when reaching very high altitudes they are merely "confetti packages."

Finally, there is the objection raised that this gun does not lend itself to firing on planes close at hand, or on planes which fly very low while they shell our troops. The angular velocity of these planes is so great, that it is only possible to follow such planes with special arms which should be almost as easily handled as a gun. The time of flight becomes very short, but it is only possible to take advantage of it if the dead time, θ, is nil. It is necessary to use percussion fire, and this percussion fire . . .

In fact, were it not for its time of flight, the 75-mm. gun in its present condition would assure, in a rather satisfactory manner, the requirements of medium altitudes.

However, the 75-mm. gun is utterly unable to fulfill the requirements of very high altitudes and also be efficient for low altitudes. What we require is a powerful gun for the former and a special arm for the latter.

Conclusion.

Gentlemen, I apologize for having held your attention for so long a time.

Whether you will or not, what you have seen of aerial warfare constitutes merely a beginning; in the future it will occupy a preponderant place.

Whether you will or not, the airplane will remain the one enemy capable of reaching you behind your hills.

Whether you will or not, the troops have been obliged, and will more and more find that they are obliged, to defend themselves against airplane attacks—airplanes employing machine guns, shells, guns—the same as they had, in old times, to defend themselves against cavalry charges.

We are at the dawn of a wide revolution as regards war methods. According to a dictum, which is not our own, "In times of old, war was of two dimensions. It has now assumed three." We used to fight on surfaces, and we were separated by lines. We have fought, and we shall more and more continue to fight, in space, where we shall no longer be separated by lines, but by surfaces.

But under these circumstances, gentlemen, what efficacy will your barbed-wire entanglements have, what value your barrage of surface routes; what will it serve you to call the entire country to arms and extend your front from sea to sea?

You will be perpetually outflanked, and war will develop, perhaps as it has during the past on the earth's surface, as it is developing still on the sea, into one of these decisive conjunctures of but a few hours' duration—which was termed a battle. A battle of air squadrons will carry within the spread of their wings the future, the honor, and the glory of their country.

And the antiaircraft defense service, what becomes of it? It will become an arm which will render it possible to organize military ports for our fleets, ports which the enemy will not dare to approach; it will permit the organization of advanced bases which the aerial admirals will use for maneuvering.

Defense of troops against discovery and aircraft attacks; defense of the vital points of a country; defense of ports and air-squadron advanced bases—doubtless all these problems have as yet only obtained embryonic solutions. Is this an argument for not reflecting thereon? It is true, we have not succeeded in creating an entirely new arm, one perfectly adapted to its rôle. Inventions are not evolved to order, and those of genius do not, in general, emerge fully

equipped from the brains of one man. They are concurrent point of a long series of efforts. Let each one of us contribute his stone to the edifice, and it will be erected.

In the meantime, when you observe our firing, do not select for measuring our errors the meter which you use for measuring yours. Add to it a first extension for taking space into consideration and a second extension for taking account of time.

If you have not the leisure for probing into these problems, for rendering yourself wise vis-à-vis our difficulties, if you can not become just, at least be indulgent.

"Indulgence, in default of justice." At a period in which Monsieur Bergeret had not yet become embittered by his conjugal misfortunes, this was the counsel which he gave most freely to his listeners.

BARR AND STROUD RANGE FINDERS.

Source: Reliable.

(13092.)

9 September, 1920.

Through conversation with a few representatives of the Barr and Stroud Company the following information was gained. One of these representatives had just returned from a trip to Germany, where he had visited the principal optical works situated in that country. He was much impressed with the conditions as found at the Ziess plant, which plant, he stated, consisted of a six to eight story building with a great deal of headroom between the floors, thus enabling long objects, periscopes for instances, to be assembled and tested in the building. Before the war there were about 5,000 men employed. During the war the number of men employed reached as high as 14,000, but since the war this number has been reduced to 5,000. He stated that they were getting back to manufacturing spectacles and binoculars to the exclusion of war products and that there was an enormous stock of binouclars on hand, numbering well into the millions, which, they told him, they expected to place on the American market as soon as trade conditions, and especially the exchange, improved. He made inquiries as to whether there was much of a market for these, presumably having in mind something along the same line for his own firm. He was told that although there was undoubtedly a large surplus of binoculars in the United States, the Zeiss Company probably had information about the market in the United States, but, however, it was a fact that binoculars were very generally bought in the United States as a sort of fad even by people who had not the slightest use for them.

He had seen most of the pots used for making glass and had come away with the impression that their own difficulty in the past had

arisen largely from not making the pots large enough. Almost anyone could make good glass in 2,000-pound pots, he believed. They had hesitated to go to the larger sizes because of lack of confidence in their successful smaller sizes, but if they had gone about it correctly they would have started in with the larger sizes. The best German apparatus he saw was their 2,000-pound pots.

He stated that the Germans had a Barr & Stroud range finder which they had tested, and that their own reports had been to the effect that Barr & Stroud coincidence range finders were the best. The Zeiss Company had always argued for stereoscopic range finders and decided that it was impracticable to jump to the other construction as their previous experience would then be wasted. He pictured it as though most German naval officers were in favor of Barr & Stroud range finders and that they had resented the Zeiss Company determining the policy for the German Navy of having stereoscopic ones.

He said that during the war coincidence range finders were being manufactured and that eventually Zeiss had been forced to make them. According to his report, practically everything was stereoscopic up to the beginning of the war, although there was a considerable service opinion expressed in favor of the coincidence range finders. Early in the war, according to his report, the German Navy demanded the other type. This was done by Zeiss under protest. At the end they were making practically all coincidence range finders. The personal interest in a report of this nature is readily understood, but it is as reconcilable as some of the other confused and mixed reports that have come through as to which type the Germans were using.

He was asked what the Germans used for antiaircraft range finders. He said that in this everything was coincidence. It was suggested that this was a peculiar place to insist upon coincidence range finders due to the difficulty in getting coincidence. He said that that was a popular fallacy. In order to work a stereoscopic range finder one had to get the target right on the line and in the center of the field while in a coincidence range finder it was only necessary to locate the target in one dimension. One had to get it both ways in a stereoscopic range finder which was twice as hard and made stereoscopic range finders unsuitable for antiaircraft work. This is in contradiction to Norwegian information recently received.

The best optical work that he saw in Germany was the German type of "any height" periscope of the pattern where the observer is not compelled to travel up and down on a sort of lift but sits always at the same level, regardless of the length of the periscope projecting from the submarine. The ray of light is reflected vertically downward and deflected by prisms near the bottom of the boat.

The gun sight telescopes appeared to be of flimsy and cheap construction and poor workmanship. They had, however, perfected very well all minor attachments and auxiliaries, such as devices for washing off the lenses and for drying out the air inside of the telescope. He said that even so small an apparatus as a director telescope had an attachment by which special dried air could be pumped into it in order to eliminate the moisture. He was not prepared to say that this was necessary in optical gear so much smaller than range finders, but for range finders and periscopes he thought it essential. Twenty minutes of hand pumping could clear out a periscope through which it had previously been impossible to see. He did not favor the use of warm air, as heating the air increased its capacity for carrying moisture. Cool air was better.

The subject of vacuum range finders was brought up again and the statement was made that the air inside of a range finder remained motionless while the range finder was being elevated, but that when the range finder was rotated, as for instance placing it on an aircraft, a different density of air was found between the lenses, prisms, etc., as a result of the rotation, thereby causing an error. But on turrets there would be little occasion for this, and that, up to about 15° of rotation, there was little to be feared. Furthermore the statement was made that experiments were made with vacuum range finders many years ago when range finders were installed on the top of turrets and exposed to variations in temperature.

The statement was made that while the pump was working the coincidence often perceptibly altered. Considering previous discussions on this subject the question was asked as to whether this change in attitude regarding the efficiency of the vacuum range finder was not really due to mechanical difficulties in perfecting them rather than to the changed conditions resulting from range finders being housed. This brought forth the statement that the end windows sometimes became distorted under pressure, particularly so at the present time, as they were making them larger in order to absorb more light. The question was asked whether the vacuum range finder was not now a thing of the past for the simple reason that it could not now be built. This brought forth a denial that this range finder was a thing of the past and that one would be built for anyone so desiring. But as all range finders were now installed in turrets it was not considered feasible to build them.

It would seem conservative and accurate enough to say that Barr and Stroud have never been able to obtain the results hoped for, and again that the present installation of range finders inside of turrets has helped all range finders to such an extent that the pos-

sibilities of the vacuum attachment have been correspondingly reduced.

The statement was made that the Barr and Stroud Company were getting ready to begin a big patent litigation in the United States for infringements of patents and probably would commence on the Bausch and Lomb Company. A particular patent was that of looking into the instrument not exactly from the horizontal, but from an angle. This, it was said was a great convenience, as it stimulated the natural position in reading. Barr and Stroud, it was said, had covered this by many basic patents, and that it was not believed that our own naval range finders had been built that way, but that it was thought that a large number of army range finders had been. It was also stated that before our entry into the war Bausch and Lomb had built a number of army range finders for the Canadian Army, which were a clear infringement of their patent rights. The question was asked why the Admiralty had not universally adopted the idea, if it was such a good one, and the information was given that it was because most of their range finders had been installed in improvised hoods on top of turrets and that it was very desirable to make these as low as possible. If one assumed the more convenient position the top of the head would be above the range finder and more headroom would be required.

One of the objects of his visit, however, seemed to be to determine what could be expected in the way of American orders.

It was stated in a humorous way that the Barr and Stroud range finders were better than German range finders, and that in fact that they were the best in the world.

RAPIDITY OF FIRE AND AMMUNITION SUPPLY OF BRITISH SHIPS DURING THE BATTLE OF JUTLAND.

Source: Reliable.

(3329.)

20 September, 1920.

From conversation with various British gunnery officers one obtains the concensus of opinion as to how the above subject is regarded by the British service at large. None of them has expressed any decided opinion as to whether or not the total amount of ammunition supplied to the British Fleet was inadequate, though it is admitted there was a shortage in some cases. One would infer from conversation that there was a sufficient supply of ammunition in the Grand Fleet as a whole after the Battle of Jutland. Any shortage that existed was in the light craft rather than in the capital ships, and gunnery officers have spoken as though the light craft indulged in

too much "fancy shooting" and if they found themselves in difficulty it was because of their own fault.

Regarding the continued supply of ammunition in turrets during a long period of action, most British gunnery officers look somewhat doubtfully upon our recent designs. While appreciating the advantages as regards speed that may often be made by the hand passing of powder and the economies in hand storage that may be made by our method of carrying the projectiles largely in the turrets and handling them by hand, they consider that this is an unwise attempt to get too much speed at the cost of endurance. They are very well satisfied with their system of hoists and cages whereby the manhandling of ammunition by the loading crew is reduced to the minimum. The opinion has been heard in many quarters that for continued and prolonged action there is nothing that they consider superior to the way their ammunition comes up with complete charges in cages. It may be slower at first, they say, but toward the end of the action the advantage of having it done without muscular effort on the part of the loading crew would tell.

British loading is not so quick, however, as they would desire. After the Battle of Jutland certain regulations were put into effect requiring that the charges being brought up should not be advanced so close to the gun as had been the practice previously. This introduced a break in the ammunition supply which they thought necessary in the interests of safety, but it kept the next charge from being quite so quickly available, and therefore somewhat slowed down the rapidity of loading. Safety after the loss of the three battle cruisers was, of course, an imperative consideration, but it may also be seen that they thought it was possible to sacrifice something of rapidity to obtain it. As has been previously stated, in the monitors firing into Ostend the turret officer took the responsibility of disregarding the safety precautions and of having the next charge ready waiting just at the foot of the second stage. He said that he did not put this up to the captain, as there would have been only one official answer possible. He thought conditions in a monitor as regards probability of hits justified this procedure and went ahead on this basis with a sense of "higher responsibility," doing it in this way so as not to embarrass the commanding officer. From this it appears that, particularly after the modified safety precautions, the rapidity of fire was not all that could be desired, but this officer in the monitor stated that he would not have taken similar chances in a fleet action.

One point that British gunnery officers often emphasize, and one which in our service, probably because we have not encountered the same experience, is the difficulty of transferring ammunition from one turret to another with sufficient rapidity. In certain actions

where the enemy was being chased, the forward turrets were the only ones that would bear. After a time the ammunition supply in these ran somewhat low and it was only with the hardest sort of work, engine force and others helping, that it was possible to get some of the supply from the after turrets moved forward to where it would be useful for the forward turrets. Conversely in running away the same conditions would probably exist. In fact, this is the particular point of British ammunition supply that gunnery officers criticize. Some feel, especially those who have been up against these conditions, that a most important feature had been overlooked in design because provision for shifting ammunition from forward to aft, and vice versa, had not been properly made. They said that they themselves would never have guessed that it would prove to be quite so necessary. They thought that they were as well fixed in this respect as any other service but that in new design this matter should be considered. The plans of the *Hood* have not been analyzed in this respect, but enough comment has been heard to make it practically certain that this matter will be considered in future British construction.

In looking at our loading arrangements British officers are well impressed with the 14-inch double turrets, particularly as regards safety. The Bethlehem turret, which was in one of the monitors in Turkish waters, was struck by a projectile and the flame did not enter the magazines. In British eyes, this experience is the best advertisement and recommendation that American turret construction has ever had.

As regards our open triple turrets, such as the *Pennsylvania* class, those British officers who have examined the plans criticize the handpowder passing as something that toward the end of an action will be very much slowed down by the exhaustion of the gun crews and do not think that they would be sufficiently safe. They believe that the open triple turrets like those of the *Pennsylvania* would be difficult to work in a long action with sustained speed and would be unsafe.

One special point that all the British gunnery officers are critical of in our design, whether it be the recent or the very latest of our turrets, is the shell handling. They used nose fuses in the Bethlehem 14-inch turrets and the stowage point downward made this somewhat difficult. In cases where our projectiles are shown standing on their bases and are to be brought into the shell hoist by sliding them across the deck, either by simply pushing or by hauling lines around them, they find it difficult to believe that this can be a thoroughly efficient manner, particularly in a seaway and particularly with 16-inch and perhaps 14-inch projectiles. They point out difficulties in case the ship had a heavy list. They say that, of course, actual

test is the only way of deciding but they find it almost impossible to believe that 16-inch projectiles can be satisfactorily handled this way in a seaway.

They consider, both from the point of view of handling heavy shell in a seaway and with the ship listed, and from the point of view of reducing the muscular effort on the part of the shell-room personnel, their method of "hydraulic grippers" with overhead trolleys or some other mechanical equivalent to these is an essential. They wonder what we will do in the case of still larger calibers.

To sum up—

(*a*) There is no sensational new information available regarding any inadequacy of ammunition supply in British vessels, even though some lighter craft have occasionally run short due to too much fancy shooting.

(*b*) British loading is more entirely mechanical than is the case with our ships built recently. They admit they sacrifice something in this respect, particularly with newer safety precautions, but prefer their construction on the grounds that in a long action a consistent rate with a fresher gun's crew will tell.

(*c*) They think that our most recent and future construction is safe and rapid as regards ammunition supply and that, in the turrets at any rate, the crew should remain fresh during a consistent action.

(*d*) Officers who have had special experience emphasize the great desirability of easy interchange of the ammunition supply between the forward and after groups of turrets as being requisite under certain conditions where the firing ship is either in pursuit or running away.

(*e*) They consider that their experience demonstrates the necessity of more purely mechanical handling of the shell supply and think that, particularly in a seaway and during a long action, our shell-room crews would be too much exhausted and would not be able to keep sending up projectiles at a satisfactory rate.

METAL POWDER CHARGE CASES, GERMAN NAVY.

Source: Reliable.

(13116.)

3 September, 1920.

Statement of Capt. Von Knorr, German Navy.

1. In the German Navy all powder charges are placed in brass cartridge cases. Up to the 6-inch, projectile and powder are together (fixed ammunition). From the 6-inch to the 16-inch, powder in thin brass container and projectile are handled separately.

In time of peace these containers were returned to the arsenals to be refilled, the larger cases standing two or three refills and the smaller calibers 10 and 15 before they had to be scrapped. In time of war the brass containers were thrown overboard, there being an opening in the back of each turret for that purpose.

2. These brass containers were explained by the fact that, although they added greatly to the weight and bulk of the ammunition, they prolonged the life of the gun, but principally that they obviated the danger of an explosion being caused by burning particles of silk remaining in the gun during rapid firing, and reduced the danger of powder burning in the upper turret and on the route from magazine to the gun.

3. It seems that everything in the German Navy was worked with the idea of safety first, and that this was explained that the first duty of the officers in a country where conscription is in force is to return the men to civil life in better shape than they were received, and that the responsibility which the officers felt toward their men would not allow of the use of silk cartridge cloth which they considered too dangerous.

4. The captain states that they had no trouble in regard to life of their guns because of the construction of the "Krupp gun," which is solid and not sectional, but stated that the brass powder case added greatly to the durability of the rifling of the gun.

JAPANESE NEW LIGHT MACHINE GUN.

Source: Reliable.

(5945.)

30 September, 1920.

The Tokyo Arsenal is now manufacturing a new light machine gun of the same model as the present heavy gun, but about 17 pounds lighter. Its caliber is 7.7 mm., and a rate of 600 rounds per minute is claimed for it. It is reported that the piece is supported by two foldable legs. The heavy machine gun also will, in the future, be made with a caliber of 7.7 mm. It is the intention to assign two of these guns per company, the number is to be eventually raised to 12. No change in the six-gun heavy machine-gun company is contemplated at the present.

In the near future the armament of a regiment of infantry will be (in addition to rifles) 6 heavy machine guns, 24 light machine guns, 1 infantry gun (approximately 37 mm.), and one 3-inch trench mortar. Eventually, when manufacture is completed, there will be: 6 heavy machine guns, 144 light machine guns, 3 infantry guns, and three 3-inch trench mortars.

TARGET PRACTICE, JAPANESE NAVY.

Source: Reliable.

(3310.)

3 September, 1920.

An observer who witnessed the first five days of the recent fleet target practice stated that only five major ships participated: that the practice was efficiently conducted, smoothly, without a single hitch or mishap (this for the first time in the history of the Japanese naval target practices). He further stated that he did not know the ranges and had no means of ascertaining the number of hits, but that the most modern fire-control appliances were used.

The firing was by salvo, and was director fire. The date was about 28 July to 2 August.

It was held off Saegi Bay, inside Kii Channel, in the Inland Sea.

Destroyer flotillas conducted gun and torpedo practice from July 15 to August 15.

DESTROYER FIRE CONTROL, JAPAN.

Source: Reliable.

(402.)

22 September, 1920.

All gunfiring on destroyers is by director and controlled from the bridge. This has given better results than individual control, but on account of confusion resulting from limited bridge space and excessive number of people required to control the fire the Navy Department is seriously discussing and contemplating at the present time a change in the system. The consensus of opinion seems to be that to increase the size of the bridge is unwise, and that a central control station should be established at a point removed from the bridge.

PURCHASE OF JAPANESE NAVAL EQUIPMENT.

Source: Reliable.

(7010–B.)

22 September, 1920.

It has been stated that the Japanese Navy Department has ordered from Vickers & Company, England, through their representative in Japan, naval equipment to the amount of 70,000,000 yen during the period January 1 to September 15, 1920.

INTERNATIONAL.

SOUTH RUSSIAN SITUATION.

Source: Reliable.

(7429–I.)

August, 1920.

(The following is a report made by the French Naval Intelligence.)

The Real Situation in South Russia—A General Impression.

It is clearly favorable. Anyone who saw the former volunteer army of Gen. Denekin can not but make a comparison much to the advantage of the real Russian Army. In this army, in addition to a change in name, changes effecting its very core have been made. Even though the territory now occupied by Wrangel is small compared to that formerly occupied by Denekin, there is an impression of a strong power, well organized and disciplined, and the feeling that the possibilities of success of this army in battle against the Bolshevists are far better than they have been in the past.

Of course no one is able to foretell to what extent a more or less disguised recognition of the Soviets by one or more of the several great powers would compromise the chances of the reestablishment of order in Russia. It is certain, however, that if the principle of nonintervention, a principle that has several times been proclaimed but never followed, really is followed the struggle between the mass of Reds and the handful of men comprising the Russian Army will be about equal.

The difference between Wrangel and Denekin may be expressed in one word, "popularity." Denekin was never popular, for he had none of the qualities of Wrangel. Wrangel is a leader, he is a Nationalist, he gives proofs of comprehension, he is just and tolerant, he replaces promises by acts.

The Policies of Gen. Wrangel's Government.

It is that of Wrangel himself all others are eclipsed by his personality. The most important posts after his own are held by Mr. Krovochine and by Gen. Nikolski (chief of the Military Administration). Without doubt Wrangel still clings to some conservative tendencies, but in case of necessity he understands how to adopt himself to a policy of Liberalism. Having practically the power of a dictator, Wrangel is not tied down by any party program, and this

fact allows him to carry out with boldness and decision those policies that to him appear necessary.

Wrangel's policies are much more clever than were those of Denkin, and particularly so in regard to the questions of nationality, relations with the partisans of Machno, and the land questions. Even though these policies are not satisfactory to all, especially to some of those of the extreme right, this discontent is overshadowed by the personality of Wrangel and by the satisfaction of the majority of the people with those policies.

The latest land reforms, the orders of the day to the army insisting that the troops render all possible aid to the peasants, and, furthermore, the effective carrying out of these orders, have gained for Gen. Wrangel the respect of the rural population, which represents the majority in Russia. This popularity, however, is nothing to that accorded him in the towns and by the Intellectuals. Again when the better classes saw order reign in place of confusion, when the news of his victories reached the rear, the popularity of this leader became so great that neither Denekin nor Kolchak in the moment of their most successful offensives could approach it.

In the army they love him as a real leader and as a brave officer; in the rear they are grateful to him for the consideration shown noncombatants. In the time of Denekin there was some discussion of the necessity of an organization in the rear, but it was Wrangel who first realized that sometimes questions of administration take precedence over strategy and tactics.

Wrangel gave as the basis for his policies of Nationalism in the struggle against the Bolshevists the defense of Russian culture. (See press notices, Appendix No. 1.)

Wrangel believes that Russia may be saved by Russian forces alone and considers foreign aid as useful, but not essential. She will emerge from the struggle victorious if she will not repeat the mistakes of the past. To defeat the Soviets is only part of the battle. The work of reconstruction is as essential as the campaign against pillage, speculation, and desertion. The combination of these circumstances was responsible for the loss of the Ukraine and the Don and the defeat of Denekin and Kolchak.

One of the causes for the nonsuccess of Denekin, if not the most important one, was his lack of psychology and his uncompromising attitude on the question of nationality and respect for the minorities. Wrangel seems to have taken a totally different tack. He is no longer opposed to a Ukrainia governed in a way satisfactory to the Ukrainians. Through him the relations with Georgia daily become more cordial. The ancient animosity toward the Jews has been replaced by an attitude of tolerance.

Of particular interest is the attitude of Wrangel toward the Tartar population of Crimea. About the beginning of July a commission attached to the Civil Administration was formed at Sebastopol. This commission was composed of delegates of the Government and representatives of the Tartar Congress, the end in view being to study "The measures that would give satisfaction to the social and moral needs of the Tartars." Almost immediately after the assembly of this mixed commission the following decision was adopted:

"The schools of the Germans, Tartars, Ukrainians, Armenians, etc., after their reorganization, would be transformed into 'national schools' and would be maintained at the expense of the State. In the secondary Tartar schools the Tartar language would be taught, together with the Russian language." The papers commented on this attitude and pointed out the importance of this decision. They praised Wrangel, comparing his action with the ill-advised ordinance of last year concerning the Ukrainian language, which completely broke up the friendly relations between the Russian people and the Ukrainians.

This measure is particularly clever as regards the Tartars. It comes at a moment when the Bolshevists are mobilizing by force the Mussulman population of the territory that they occupy. After the grave disorders of Azerbaidjan, where, in spite of their promises, the Bolshevists did not respect the manners and laws of the Mussulmen who received them as liberators. If Wrangel is able to win to his side all the Mussulmen element of South Russia his national and moral forces will be increased to a large extent.

The Relations of the Russian Army with Machno.

While Denekin was unable to maintain friendly relations with Machno and the other bands of insurgent peasants, and thus was obliged to keep a part of his troops to fight against them, Wrangel seems not only to live in peace with them, but further wins them over to his side to fight against the Bolshevists. Actually, Machno may be considered as an ally of Wrangel. In one of his orders of the day Machno writes: "I will do no harm to the Russian Army, but I insist that its acts correspond with its speeches." The followers of Machno, Yatzenko, and Savtchenko go even further and make an appeal to the Russian people to unite with the Russian Army in its struggle against the Bolshevik oppressors, and even appeal to the insurgents Grichine and Protchance. (See Appendices Nos. 2 and 3.)

These insurgent bands are of great assistance to the Russian Army. In the vicinity of Sofiefka Slavgorod the Machno detachments have dispersed over 17,000 Bolshevists. They have destroyed the bridges and railroads in rear of the Reds. Besides this military aid, the

alliance of Machno has a most desirable effect on the peasants, who have the greatest confidence in him, considering him as their champion. The attitude of Wrangel toward Machno, together with the land laws, has caused the peasants to have greater confidence in the Russian Army.

The Relations of Wrangel with the Bolshevists.

Wrangel made an appeal to the officers and soldiers of the Reds, promising amnesty to those who would join the ranks of the Russian Army. This appeal was made after a victory which considerably enhanced its value. (See Appendix No. 4.) He forbade the shooting of Red prisoners, and a considerable number of these prisoners voluntarily entered the Russian Army. But the struggle against the Bolshevists in the interior still remained difficult; conspiracies and assassinations were numerous. At the end of June four infernal machines were found near the station at Bebbek, and again on the 4th of July there was a fire and explosion of a large quantity of munitions. It was with great difficulty that two ships, the *Saratoff* and the *City of Venice*, which were lying in the bay near the place of the explosion, were saved. On the 19th of July there was an explosion on board the *Don*, which was a result of Bolshevist propaganda that had been circulated amongst the workmen.

The workmen who were discharging the cargo of the *Don* had agreed to a salary of 500 roubles per pood discharged. In the midst of this work they demanded 1,000 roubles per pood, threatening to discontinue work if this increase was not granted. As a result the stevedores were making 30,000 to 50,000 roubles a day at a time when but few officers and state employees were making 50,000 roubles a month.

Wrangel and the Extreme Right Factions.

The Extreme Right party is a source of more danger to the Russian Army than the Bolshevists themselves. Even though Wrangel himself is conservative, and has dictatorial powers, he understood that an extreme policy would lose the Crimea for him and consequently he listened to the voice of the people. The monarchists of the Extreme Right, on the contrary, do not understand this. They consider Wrangel's policy too liberal, especially in regard to the land question and to the Jews. For example, Krivochine does not agree with Wrangel on the land question, and would only accept his post after this law, which he did not wish to bear his signature, had been published. He reserved in this way the right to present objections to it should he wish to do so. A plot against Wrangel was even arranged, the leaders being naval officers attached to general headquarters, and those of the battleship *General Alexieff*. Fortunately the plot was discovered in time, but the monarchists did not allow

this setback to deter them and accused Wrangel of advocating a too tolerant and too weak a policy. The struggle is not being carried on openly but the organizations of the monarchists in foreign countries, *the two principal centers of which are at Berlin and Constantinople*, work with energy and have frequent communication with the Crimea.

State of Mind of the People.

The laboring class have lost all moral sense, all patriotic sentiment, and all idea of work. Officially, the Government attempts to assist them, but actually it is but little concerned over them. The prominence of the laboring class in political affairs diminishes daily. Actually those workmen who are converted to Communism by Bolshevist propaganda are exiled to Soviet Russia. On the 20th of July, for instance, five persons suspected of having instigated the strike of the port workmen at Bebbek were transported by sea to Red Russia.

The Peasants.

The majority of the peasants has no political opinions. They only ask of the man in power that he keep his promises. Seeing that the army no longer pillages, that it encourages them and aids them in working their lands, they sympathize with the Russian Army; consequently in such measure as the land law is applied, so grows popularity of this authority. This fact is clearly demonstrated by the success with which mobilization has been accomplished wherever this land law has been applied. The organization of the central authority interests them but little, but one can say that they would accept no form of government that would involve losing their lands. The paper "Velikaya Russia" states: "The land law, the order of the army to aid the peasants during their harvesting, and the plan of the law for the 'Zemtvos' of the inhabitants are all stepping stones for future reconstruction. It has been reported that a commission of surveyors has left Sevastopol to apportion the land among the peasants. The best propogandists are those who bring with them peace and the appeal to work. The mighty will of our guide has left the realm of collective politics and has spoken directly to the Russian people. He has definitely chosen the road to vital realization. The country is being reborn and millions of ears listen to what is going on in Sevastopol. Without superficial settings, and without constraint, the country makes its initial start in aiding the Russian Army. Except for manufactured products the Russian peasant lacks nothing.

"The old method of buying has disappeared and everything is done by exchange. For instance, at Kirilouka, a little village on

the Sea of Azov, the peasants don't desire money, but gladly trade a goose for a box of matches, or a pig for an old pair of shoes."

The Intellectuals.

They uphold Gen. Wrangel and have moderate, liberal tendencies, and believe in the force and stability of the Russian Army. One hears on all sides that it is time to repatriate those who were transported to the Princes Islands.

The Press and Propaganda.

The press gives its support to the Government and endeavors in every way to uphold it. It emphasizes above all the necessity of not making those errors which caused the loss of the "Volunteers" and the downfall of Denekin. We cite as characteristic articles "The Declarations of Gen. Wrangel and the 'New Way'" (Appendices Nos. 5 and 6). The press, however, is passing through a very critical period, as paper is almost priceless. A "pood" formerly was obtained for 3 roubles, but now it is actually worth 48,000 roubles, and is very difficult to obtain even at that price.

The old propaganda organizations no longer exist. The famous "Oswag" is disbanded. In the order of the day which suppressed special organizations for propaganda, for civil and military information, one may read the following: "Let authority be judged by its actions. Facts are the best propaganda." Censorship still exists, and as an example we cite two characteristic articles censored by Wrangel's order. On 18 July a paper called "The Russian Truth" made its initial appearance at Sevastopol and declared, "Our motto is for religion, the Czar, and the country." Our appeal is "To Moscow." The 15th of July this paper was suppressed by Wrangel's order. (See Appendix No. 7.) In another note (Appendix No. 8) Wrangel dismissed the chief censor at Theodosia for allowing an article against the English to be published. Apropos of the Russian press, one finds there fewer lies and slanders against the Bolshevists, for it is at last understood that the simple truth is bad enough and requires no additions.

Foreign Policy.

The Government no longer considers the aid of the Allies helpful, and in an order of the day Wrangel speaks of them as "Our Allies of the past and our guests of to-day." The sentiment toward the Francophobes is softening. The English are disliked because of their negotiations with the Soviets. Poland is reproached for having brought about a struggle, not against bolshevism but against her hereditary enemy, Russia. The situation is considered grave, but grave only for Poland. The possibility of a concentration of Red forces against the Crimea after they defeat Poland does not disturb

the Russian Army. Contrary to the fatal policy of Denekin, Wrangel is making every effort to reestablish the most amicable relations with the new States formed from ancient Russia, particularly with Georgia.

Conclusion.

One can not be too certain that if the Bolshevists should throw all their strength against Crimea the latter would be able to resist. What one may say, however, that never before has the Army of Order in Russia had so many good factors in its favor, and never has it so deserved to live.

APPENDIX NO. 1.

Interview with Gen. Wrangel (Velikays, Russia) at Sevastopol on 18 July, 1920.

I had the opportunity in the course of an interview with General Wrangel to question him on the policies of the commander in chief. The general then informed me of his ideas concerning these policies. *Why are we fighting?* To this question the general replied:

There is but one answer, we struggle for liberty. On the other side of the front reigns slavery, oppression, and arbitrary rule. One may differ in opinion on the question of the advantages of such and such an organization of the state; one may be Republican, Socialist, or even Marxist, and recognize, nevertheless, that the Republic of the Soviets is an example of a despotism without precedent, under which both Russia and the new proletariat class would perish. It is no longer a mystery to Europe, now that the veil under which Soviet Russia formerly was sheltered has been lifted, that the nest of this reaction is at Moscow. It is there that are found the slave drivers who treat the people like cattle. Only those who are blind or who are of bad faith have the right to consider us as reactionaries. We are fighting to save the people from a slavery such as was never known, even in the darkest hours of our history. In Europe they have not understood until now; but to-day, it seems, there begins to dawn on them the things that were so clear to us, the world importance of our quarrel, and our family fight. If our sacrifices are in vain, it is the society and the democracy of Europe that will be obliged to take up arms to defend their political policies and their culture against this enemy of civilization who will be successful over us only through their encouragement.

The Master.

The word "master" has had but little success, and though it has become widespread there really is no master in Russia. I have never dreamed of being this master, and I consider it as my duty to emphasize this most emphatically.

But neither will I ever recognize as master of Russia the "Sovnarkem" (council of the people's deputies) of Moscow, which does not derive its authority from anyone, but which has instigated the anarchy which reigns throughout Russia. The term "master" signifies the Russian people. It is the people that will decide the future form of government in Russia, and if they desire a king Russia will become a monarchy. If they consider a republican form of government for her, it will be a Republic, but the people will have to be given the chance to express their wishes without extraordinary commissions and without machine guns being turned upon them. The Bolshevists dispersed the constitutional assembly; they assassinated or imprisoned several members of that assembly. The Bolshevists fear all legal representations which permit the people to express their wishes; personal views have no importance. From the day I took command I put aside all personal inclinations to form one or another state organization. I willingly submit myself to the voice of Russia.

The Jewish Question.

There is really among the mass of the people a growth of hate against the Jews. This sentiment is growing stronger and stronger among the population. It grows in the slime of Bolshevism. They see the Jewish commissions, the Jewish communists, and do not ask whether this group of Jews is or is not separated by ideas from the rest of the Jewish race that does not share the communist doctrines, and that does not recognize the power of the Soviets. I consider all "pogrom" movements and all propaganda in this light as a public calamity against which I will fight with every means in my power.

Every "pogrom" is a source of decomposition for the army itself. The troops who take part in them become insubordinate. In the morning they fire on the Jews, and toward evening they begin to fire on the rest of the population. The Jewish question is a secular question, painful and difficult, and if it can not be solved in time by measures of healthy policy this can be done by no other power than one built on law and on real force.

In a country where anarchy and willfulness reign, where the inviolability of person and property does not count, the field is open to the violence of one part of the population against the other. It is only necessary to see in the growth of animosity in the population against the Jews the proof that the popular masses are opposed to communism, and that erroneously they identify it with the Jews. Every time, in fact, that the power of Bolshevist activities is reanimated in any locality the anti-Jew movement flourishes at the same time.

Russia and Europe.

I wish with all my soul that this civil war would end. Every drop of Russian blood spilled hurts my heart. But the struggle is inevitable until our enemies are enlightened, until those men understand they are fighting against themselves, against their right to independence; that they are committing political suicide against themselves. Until the day that a stable power is established in Russia, a power so constituted to be formed on the principles of legality, of security of person and property, on the principles of respect to international obligations; until that day Europe will never know peace nor the betterment of its economic conditions. Until that day no international agreement, however small, may be concluded, nor political questions so treated that they will bear fruit. Future history will appreciate the abnegation of the efforts of this handful of Russians in the Crimea who, abandoned by everyone, on their last shred of Russian ground, fought to save the fundamentals of human happiness, for the homes far from European culture.

The cause of the Russian Army in the Crimea is the cause of liberation. It is the Holy War for liberty and right.

APPENDIX 2.

Proclamation of Yatsenko, Commander of the Detachment of the Partisans of the Name of Machno.

Glorious insurgents of the Ukraine, I, the commander of the detachment of the partisans of the name of Machno, call you to our ranks, to strike with all our forces, to attack the Communist vampires who shoot our comrades. This autocratic commissariat we must wipe away from our country. There is no more Denekin; it is only to the Russian Army that we hold out our hand. Let us fill up our ranks. Let us love and free our Holy Martyred Russia from the yoke of the commissaires, and we will form a power corresponding to the

wishes of the people. Long life to Holy Russia and the Russian people.— *The Commander of the Detachment of the Partisans, in the name of Machno Yatsenko.*

Proclamation of the Commander of the Detachment of the Insurgents, Alexis Alexaienitch Savtehenko.

I have had the opportunity to convince myself that the Russian troops do not shoot insurgents with whom they walk in harmony, nor the comrades of the Red Army who are sent against the real working peasants and workmen by the commissaires and Communists. I call you all to place your arms at the feet of those who wish to accomplish the will of the people, who wish the land for the peasants, and the true liberty. Enlist in the ranks of the insurgents, in the ranks of the Russian Army. Either one will give to Ukraine and to our mother Russia peace, order, and rest.—*Savtehenko.*

APPENDIX 3.

Proclamation of the Insurgents and All You Who Love Russia.

Our country is dying. We hear its death rattle; we see its agony. There is no more bread, nor fires, nor clothing. The Commune has ruined everything. The commissaires have brought us only famine and death, in spite of their promises to give us bread, liberty, and peace. We do not count on strangers. We must save ourselves. We know that the soldiers of the Red Army already know where the Bolshevists have lead them. Their Russian consciences are awake. Sacred fire and indignation consume Russia. Carry that fire, stir it up. It will burn the Commune and those who preach it. Every minute of delay brings days of suffering to our country. Everyone, as one man, enter the insurgent detachments and the Russian Army, which I saw myself and which I am convinced will bring liberation from the Bolshevists and restore peace and order.

24 June, 1920 (old style). Grichine.

Russian Citizens.

I have never submitted to the Bolshevists and I never will submit to them. I have raised the people against them, because the Commune means death to the people and the Bolshevists can do nothing without the Commune. Before, I was alone with the insurgents; now I know the Russian Army fights for the people and I join myself to it. Insurgents, rise! As one man, go into the Russian Army. Rise up, Ukrania! Awake, Russian people, raise yourself against the Commune and the commissaires! Overthrow the oppressors who for three years have watered the land of Russia with the blood of her sons, and we will found a new world based on right and truth.

Protchane, 23 June (old style).

APPENDIX 4.

(Article from the Crimean Courier, Yalta, 21 June–4 July, 1920.)

The Insurgent Movement.

A few days ago, speaking of the feelings of the peasants toward the Russian Army, we expressed the hope that our policy would be wise enough and clever enough to direct the revolution of the peasants against communism, following

the channel favorable to the common cause. Like all primitive movements, the movement of Machno is involved. Like all primitive movements, its base is healthy, but it contains not a little of the elements of destruction dangerous to the State. To neutralize these latter elements, and to reenforce the sound principles (desire of order and the tendency to public life, which are certainly at the bottom of the peasant movement), there is the problem which is put up to the Government. This problem has been successfully solved by the promulgation of land law. Actually, we have irrefutable proofs that the movement of the peasants against communism is turning to the advantage of the Russian cause. The appeals of the chiefs of the "Moujiks" (Yatsenko and Sevtchenko) for the anti-Bolshevist movement have excited the people to fight against the Bolshevists in complete alliance with the Russian Army.

It is only to the Russian Army that we hold out our hand. Let us fill up our ranks. We love and we will free Holy Martyred Russia from the yoke of commissaires, and we will establish a power answering to the wishes of the people.—*Yatsenko.*

Savtchenko expresses himself in a manner even more precise:

I call you all to place your arms at the feet of those who wish to accomplish the will of the people, who wish the country for the peasants and for true liberty. Thus we assist in an event of colossal importance; the rousing of the "Moujika," the movement of the people who have done so much harm to Russia transformed itself into a beneficent force which will aid in the reestablishment of order. This event, if they know how to profit from all its consequences (a thing which we do not doubt), will determine the future march of history, and will give the aid for the reconstruction of the country awaited for so long a time.

APPENDIX 5.

Address of the Commander in Chief, Gen. Wrangel, to the Red Army.

Russian citizens, officers, and soldiers of the Red Army: Russia, our country, is perishing. Our faith is not recognized, our sanctuaries are profaned. The people are under the yoke, the towns are suffering agony. The factories work no more, there is no more commerce, the fields are not planted. We are all on the edge of ruin. Recall all the promises of peace which have been made you. They divide Russia into Bolshevik communes, and you imagine that they can reconstruct it like that. You think you are serving the Russian people and you give your lives for the "Internationale," which recognizes no nationality. Don't you see that Russia, a stranger to the Bolshevists, is for them only a torch which will light a world-wide fire? Little it matters to them if only a few cinders remain of that torch. Why do you fight? For your slavery, for the communist commissaires torturing innocent people in the prisons, for the fanatics who do nothing for Russia, for an oppression that will surpass everything you have ever seen, even in a convict prison? We are fighting, not against you, but for you, for what you have, for the liberty and grandeur of Russia. In the Crimea we have already given land to the peasants. We bring freedom to the people, good wages to the workmen, the participation in benefits and the right to work. Blood has flown for three years. For three years brothers have killed one another. Go back to your homes or come with us. Then this stupid carnage will cease. Then all the people, purified by suffering, will establish a government which will assure you a happier life and

one really free. Then all will be forgotten. Brothers, officers, and soldiers of the Red Army, we hold out our hand to you, hold out yours to us. Save our mothers, our Russia.—*Gen. Wrangel.*

APPENDIX 5A.

(Article from "The South of Russia," Sevastopol 7/20 July, 1920.)

Declarations of Gen. Wrangel.

In every country with parliamentary government, each new Government has by custom preceded its work by a declaration of its policies. This custom has flourished in Russia for a long time, and from Sturmer to General Denekin all the succeeding authorities have always commenced by such declarations. They made promises which they could not fulfill; they undertook to establish a well-being that was impossible. Also must we not be amazed that after having been deceived so many times we have no longer wished to believe such declarations of the Government, so pompous and full of promises as they have been? Since Russia has lost the great power she once had, General Wrangel is the first who has taken his post without promises or declarations. The interview of the commander in chief by the reporter in the paper Velikaya Rossiya is not a declaration. A declaration in reality foresees the future policies, while in his interview General Wrangel exposes to view the sum of the political acts already realized. After the promulgation of the land law, a law in which one sees consecrated for the first time the idea of "the land to the workers;" after the many ordinances which disclose the attention which this authority brings to consider the needs of the workmen and the peasants, after the reconstruction of the organization of the local autonomy, the answer to the question—Why are we fighting?—comes of itself. We are fighting for the liberty of the people, to save it from a yoke such as has never been known even in the darkest hours of our history.

In this interview General Wrangel found it useful to define the meaning of the word "master," a word that in some circles of society has been interpreted in a way both narrow and untrue. Those who hope to make Russia retrograde again are inclined to predict future events, and the word "master" which the commander in chief employed in one of his orders of the day they have utilized to attribute to General Wrangel's intentions that are far from his thoughts. "The master is the people itself. The life of a country must be regulated by its wishes." These well-defined words put an end to the unworthy interpretations to which the word "master" (which obtained too much success, says General Wrangel) had given rise. With the order to close up the newspaper of "pogroms" (the "Russian Truth"), an order in which he condemns the fight against the different nationalities, the thoughts expressed by General Wrangel in his interview show us in a very definite way the point of view of the Government on the pitiful Jewish question. Seeing the source of the anti-Jew movement in "Bolshevik rottenness," the leader plainly condemns those who try to sow animosity between the different races and consider the "pogroms" as a misfortune to the country, because they bring about the disruption of the army. The resurrection of the Russian Army, which has been for us a veritable miracle, shows us what the force of an army consists of, and General Wrangel explained it to us in his interview. In the struggle against Bolshevism the commander in chief does not wish any half measures. The struggle will last by utilizing all his efforts until Russia is delivered from the yoke of its oppressors.

From this point of view General Wrangel has the right to consider that our struggle is interesting to the entire civilized world. World peace is not possible as long as Bolshevism exists as a center of reaction and anarchy. The interview of General Wrangel is a document of great public importance, and it is regretted that all the papers could not publish it to give the greatest possible circulation.

APPENDIX 6.

Article from the "South Russia," Sevastapol, 11/20 July, 1920.

The New Way.

It is yet only a little time ago that our psychology was as follows: In spite of all the divergent opinions and discussions ("I have never seen two Russians who had the same opinion on the same question," a foreigner has told me) we were always agreed on one point. Since Russia has practically ceased to exist as an empire, we have become accustomed to tell ourselves that her future destiny no longer depends on us, but on outside aid. I remember how they waited for the French at Odessa, the telegrams of Consul Henno on matters of decisive importance. They waited for the black troops. They believed that when the Germans left the Ukraine it gave full power to the French. Some one had seen the Senegalese in the streets of Karkboff, others had seen "with their own eyes" a party of prisoners who had been made blind by ultra-violet rays. In a word, one waited. Afterwards, when Denekin was in power, it was England who helped us. Our army wore English uniforms, our cannon fired English projectiles; everywhere one saw the friendly hand of England. And during that long period of civil war the idea became fixed in us that we could only resist with foreign help.

In the interior we spent our time in quarreling with each other. That mattered little, since, with the powerful aid of the victors of the World War, we also must come through our battles victoriously. The Russian voice was heard less and less. The more involved that our difficulties became the more we looked toward the West. The "Waldek-Rousseau," was he still in the roads? The "Emperor of India," is he still there? It appeared that if they were still there everything was not lost. What would happen if they left? It appeared to us that we were completely tied to the colors of the flags which floated in our port. We had to fall to the bottom of the whirlpool before life could be reborn for us. And little by little this new life took form.

Why change the name of the Army and call it the Russian Army, instead of the Volunteer Army? What importance are mere words? Only a little while ago many people put that question. But now the reason for the change has become very clear to us. On the ruins of the past was reborn the true "Russian Army." We no longer fear for this single army to resist the Bolsheviks hand to hand. We are grateful for the aid that foreigners are kind enough to bring to us, but we will never more be slaves to their ambitions. We have now our own will and our own problems.

Little by little the thought has come to us that we should aid ourselves, and that the "Conquering of Bolshevism from within" would come about, not by capitulation before the Reds, but from the consciousness of our dignity. Here in the south the national idea began to manifest itself, not by hysterical cries, but in every-day life. In our roads there were always foreign vessels, from which their flags floated. We welcomed those who arrived among us, and

gave "bon voyage" to those who weighed their anchors after a long stay. But the noise of weighing anchors did not cause despair to rise in us any more. In our consciousness resounded the words of "Nieutzche," words simple and proud, "Aid thyself, and then everyone will aid thee."

APPENDIX 7.

Order of the Commander in Chief of the Armed Forces in South Russia.

Sevastopol, 30 June, 1920. (No. 3384.)

I have indicated many times that during the grave hour in which we are living it is absolutely necessary that there be union among all the citizens of Russia for the good of the homeland. All animosity of nation, of class, or party, is inadmissable, as a prevention of working together for the common good. However, antagonism by one part of the population against another has not yet stopped, and the officials of the Government have not employed the necessary measures in cases which concerned them to nip the evil in the bud.

I have before me a number of the newspaper "The Russian Truth," which contains a certain number of articles having the character of "pogrom."

1. I express my displeasure with the chief of the military censor section, Col. Ignatieff.
2. The chief censor, Col. Wlassieff, will be relieved of his duties.
3. The newspaper is suppressed.

GENERAL WRANGEL.

APPENDIX 8.

Order of the Commander in Chief of the Armed Forces in South Russia.

Sevastopol, July, 1920. (Order No. 3390.)

In No. 123 of the newspaper, "The Evening Times," was published an article entitled "From day to day," an article inadmissable about a country whose soldiers and sailors have sealed its friendship with Russia with their blood.

The article has no foundation; the statements made there do not correspond to facts. I can not permit the insertion of an article without basis concerning our duties of just a short time ago and of our quests of to-day.

1. I express my displeasure with the chief of the military censor section, Colonel Ignatieff.
2. The chief censor at Theodosia, Lieutenant General Zalesskiy, will be relieved of his duties.

GENERAL WRANGEL.

Subject: Australia's Defense Policy.

Source: The "Argus," of Melbourne, Australia, of September 10, 1920.

Before a crowded House the Prime Minister (Mr. Hughes) delivered his long expected policy speech on defense matters in the House of Representatives last night. After dealing at some length with the international situation and Australia's obligations under the League of Nations and as a partner in the Empire, Mr. Hughes stated that a scheme of imperial defense was being formu-

lated, and until an agreement had been reached the proposals of the Ministry must be regarded as tentative. He hoped that real imperial defense policy would be formulated at the Imperial Conference next year. He intimated that citizen force training would be resumed this year and that proposals would be brought forward to amend the defense act in order to concentrate the training in a lesser number of years. The Ministry will invite the cooperation of members of the A. I. F. in forming the basis of the defense force. A sum of £500,000 is to be provided for an air force, and £100,000 to encourage civil aviation. The manufacture of *aeroplanes and engines in this country is to be encouraged by a "very substantial bonus."* The estimates of expenditure given by Mr. Hughes were as follows: *Naval, £3,959,000; military, £250,000; aviation, £600,000; total, £7,809,000.* The military and naval expenditure in 1913–14 was £4,645,467.

Mr. Hughes said:

In order that members may better appreciate the part of the budget shortly to be placed before the House which relates to defense expenditure, I desire to make to the House a preliminary statement regarding the defense policy of the Commonwealth. I shall not detain the House in considering how far those ideals which are cherished by so many earnest men in a world where the sword is beaten into plowshare are capable of realization, because it is very clear from a close survey of the world as it exists to-day that only by sufficient preparation for effective national defense can the political integrity and the freedom of nations be maintained. Nor need I occupy the attention of the House in putting the view that, *although Australia must be defended, she need not undertake the task herself, but may rely on the protection of the British navy, or upon the good offices of the League of Nations.*

Four Main Factors.

Now, what are the main factors in the determination of this survey of defenses by sea, land, and air which it is necessary for Australia to maintain in the immediate future? As I see them, they group themselves into four headings: 1. The general international situation. 2. The League of Nations as regards (*a*) the obligations it imposes, and (*b*) the protection it affords us. 3. Our partnership in the British Empire. 4. The special conditions of Australia, including her geographical situation and the Australian policy and ideals, especially the White Australia policy. Consider the international situation as it concerns us to-day. The World War is over, but it can hardly be said that world peace is yet in sight. The world is now disturbed by propaganda which menaces alike the world and the political integrity of nations, propaganda which, whether we speak of it as Bolshevism or Sinn Feinism, or whatever name we call it, nevertheless does most certainly disturb and menace the peace of the world.

Mr. Considine.—Why not call it liberty?

Mr. HUGHES.—The world as we see it to-day is obviously a world in which no nation can allow its war insurance policy to lapse. [Hear, hear!] Turning from the international situation, let us look at the League of Nations. The league represents a noble ideal, and its acceptance by the greater part of the civilized world is the only hope of enduring peace. On its ultimate success depends the future of civilization. But the league is yet in its infancy, and it is Utopian to expect from the league in its present stage of development that protection which would render unnecessary any precautions for our own defense. [Hear, hear!] War can not be banished from the world by a stroke of the pen. The success of the league depends on the growth of the peace spirit. We should be living in a paradise of fools if we did not recognize that at present the will to war exists as keenly in the mind of man as ever it did. We have lately seen how powerless the League of Nations is in a de facto state of war. There is Poland within a stone's throw of the greatest military forces the league has at its disposal. Yet we have seen Poland overrun by those latest missionairies of peace [laughter]—the Bolsheviks—and left to her own resources. Poland owes her freedom to-day not to the League of Nations but to her own valor. [Hear, hear!] If this situation applies to Poland, within a few hours of the great military resources of the league, how much more does it apply to us in our geographical and political isolation! But in any case there are some questions that can not be submitted to the arbitrament of the league. So much is recognized and expressed in the covenant of the league itself. Great Britain, for instance, could not submit the freedom of the seas as interpreted by Germany to the arbitrament of any league: America could not submit the Monroe doctrine; and we could not submit the question of a White Australia. [Hear, hear!]

A Vital Policy.

Britain and America must be prepared to fight to the death for these principles, which we believe to be absolutely vital to our existence. The most vital point of our policy is the White Australia, and it is also the one which is calculated to be the most fruitful in provoking international complications. I do not believe that there are 5 per cent of the Australians who will not readily admit that on this principle there can be no concession. I put our position before the Peace Conference most clearly, and the overwhelming bulk of the people of Australia agreed with me, whether they agree with me politically or not. On this principle we must be always ready to defend ourselves. [Hear, hear!] We can not hope to maintain a White Australian policy by mere pious or blatant declarations of our intentions and determinations. Behind this there must be some force, and it can not be anything less than the utmost resources of this Nation. There rest upon us also our obligations as a partner in this great British Empire. Our other ideals and that partnership impose upon us obligations which we must be ready to fulfil. [Hear, hear!] We have signed our name in the most solemn way to the covenant of the League of Nations, and the league guarantees this country its protection. The covenant may be regarded as the Law of Nations. But there is required behind every law some adequate force to compel people to obey the law, so behind the league there must be an adequate force. There is no international force

per se. It is an international army, recruited by quotas from each nation which is a member of the league. There is imposed upon each nation, ourselves included, the obligation to contribute its quota to this force. What our quota is to be has not yet been determined. It is interesting to turn to the covenant and see what we have put our name to. Article 8 requires a reduction of national armaments to the lowest point [caucus cheers] consistent with national safety.

Mr. MATHEWS (Cau.). How many millions is it going to cost?

Mr. HUGHES. If the Commonwealth desires to beat its sword into a plowshare, as a member of the league it can not do so. There is imposed on it a solemn obligation to furnish its quota, which must be such, in the opinion of the league, as is sufficient to maintain peace—the peace of the world. The quota of Australia will be determined not merely by its population, but also by its geographical situation, and by the likelihood of danger to civilization which may enter through its doors. Article 10 is designed to preserve the members of the league against external aggression, and maintain their territorial integrity and existing political independence. If the territory of a member is assailed there is an obligation on us to go to her assistance. America is hesitating to sign the covenant for that reason. She says, "Why should we be involved in the quarrel with Europe?" America found that it was impossible to maintain a policy of splendid isolation. The day has long since passed when isolation is anything more than a mere name. The world is coming closer together, and the dangers that assail civilization from one part assail civilization in every part. Freedom is a tender plant. It is not the herbage of the moment, but a plant of tender nurture that has been watered by the blood of the martyrs and enriched by the sacrifice of the people through the ages.

Australia and the Empire.

Now, let us look at what is involved by our partnership in the British Empire, for there are obligations cast upon us to provide adequate forces to play their part in the defense of the Empire [Hear, hear!] President Wilson's maxim of "No league within the league" could not apply to the British Empire, which is sui generis. There is nothing in history like it. It is a federation of free nations separate yet one and indivisible. [Hear, hear!] It is a federation of free nations, having the same ideals, having the same mother, and bound together for their own protection, as well as for the peace of the world. I venture to say—much as has been said against this Empire—that no single factor has been more effective in preserving the peace of the world and advancing the interests of mankind than the British Empire. [Hear, hear!] We are part of the Empire, and must bear our share and do our part in the protection of the Empire. We can not leave to Great Britain or to the British navy the whole task of defending this great Empire, on whose stability our very existence depends. [Hear, hear!] Great Britain is staggering under a load of debt, the like of which the world has never seen. We speak of our war debt; but the people of Britain are bearing a load incomparably greater. So there are obligations upon us, by virtue of our membership of the League of Nations, and by virtue of our partnership in the British Empire, to provide adequate defense forces for Australia. Consider for a moment our geo-

graphical situation. Australia is a continent, as remote as possible from the European nations. To the northwest we have a huge population of 750,000,000 people—half the population of the entire earth, and 150 times the population of this Commonwealth. They are nearer to Australia than to the nearest European population.

We have a coast line of 12,000 miles, and, in addition to that coast line, we have now taken over control of islands in the Pacific, which involves upon us new obligations and new responsibilities. We have a vast oversea trade worth £250,000,000 per annum. In addition to that trade, we have an interstate and intrastate trade. Up to 1906 the center of naval policy, so far as the British Empire was concerned, centered in the Mediterranean. In 1906, owing to the growth of the German menace, it shifted to the North Sea. As a result of the war the center of gravity has again shifted, and in the interim between 1906 and 1920 the Pacific has assumed a new importance. The Panama Canal, in some degree, accounted for this. The Pacific Ocean, which represents one-third of the whole surface of the earth, extends from the Arctic to the Antarctic, and is a pathway along which the almost limitless commerce of the world travels. Our isolation, not less than our great resources—distant as we are from the rest of the world—make it important that we must be prepared to defend ourselves. [Hear, hear!]

The Three Essentials.

Having thus very briefly reviewed the considerations upon which the policy is based, let us now consider what that policy must be. We have definite responsibilities and obligations to share in the defense of the Empire, and particularly in the defense of the Pacific. At the same time we have recognized limitations. They are due to the smallness of our population, the heavy burden which the country has had imposed upon it by the war, and the fact that we are a peace-loving continent, upon whom the burden of maintaining a large army and navy is distasteful. A scheme of imperial defense is being formulated as a result of deliberations of representatives of Great Britain and the overseas dominions. Until it is determined the proposals of the Ministry must be regarded as tentative.

There are three essentials for an effective army. First, there must be a highly trained staff: second, there must be a sufficiency of munitions and equipment: and the third essential is training. The highly trained staff need not consist merely of permanent officers, but may include citizen officers. Australia, I think, has shown that she possesses this staff. [Hear, hear!] As to the effective supply of munitions and equipment, we have received the equipment of the divisions of the A. I. F., but we are deficient in heavy artillery and munitions for light guns. It is obvious that without effective equipment no army can take the field with any hope of success. The Ministry will place on the estimates proposals for the commencement of the work of remedying our deficiencies in this respect. I come now to the third section—training. We have in Australia the members of the A. I. F., which in the immediate years to come could, if the necessity arose, be placed in the field. The Ministry intends to invite their cooperation to form the basis on which the future armies of Australia may be trained. Approximately 16,000 young men

reach the age of 18 years annually. It is proposed to recommence the training of this young manhood this year, but only to a limited extent, owing to the financial difficulties. Proposals will be brought forward to amend the defense act to concentrate the period of training in a lesser number of years. Details of this scheme will be furnished to the House later. The Ministry will invite the cooperation of the members of the A. I. F. in transmitting to the citizen forces of Australia their splendid traditions, and the old units of the A. I. F. will become part of Australia's defense scheme.

Some Comparative Figures.

Some figures might be given to afford comparison of the cost of the scheme compared with previous years. In the year 1913–14 there were 54,051 persons in the citizen forces then liable for training. This year there will be 108,000 liable. The cost of the training in 1913–14 was £648,000. This year, owing to the reduced period of training, it will be £423,000. The number of permanent-force men in 1913–14 was 2,627. This year it will be 2,603. The personnel of the civil staff in 1913–14 numbered 715. This year there will be 995. In 1913–14 the total expenditure on defense was £2,644,000. The total military expenditure this year is estimated at £3,250,000. In comparing these figures it is necessary to take into consideration the difference in the purchasing power of money.

Turning from the military aspect to consider the naval and air forces, Mr. Hughes said that it might be confidently expected that aviation and those other scientific methods of warfare which had developed so rapidly during the war, and particularly during the latter part of it, would develop still further, and no doubt the development would completely revolutionize warfare.

Let us hope that it will make warfare impossible, continued Mr. Hughes.

That is the earnest prayer and hope of every civilized man, but at present we must consider the Navy as our first line of defense. It will be a bad day for us if we have to defend Australia in Australia. [Hear! hear!] I say emphatically that either by sea or air we must keep the enemies of Australia outside of Australia. If they come here we shall do what we can, but it is better that they should not come here at all. And therefore I say our first line of defense must be the Navy and the air. Sea power has long been recognized as essential to the political integrity of great nations, and it is on the sea that our destiny lies: it is on the sea that we must uphold our freedom.

The air is the newest element man has conquered, but, for the time being, it is still to the sea that we have to look for our defense. By general consent, naval mastery is dependent upon capital ships and not on submarines and light cruisers. The battleship is still the decisive factor in naval war. Now the maintenance of a great fleet is beyond the capacity of 5,000,000 people. We must remedy that by getting more than 5,000,000. [Hear, hear!] In the meantime, we must cut our coat according to our cloth, but it must not be supposed that because we are, perforce, compelled to walk slowly, relying on

light cruisers and similar small craft, we believe that in these we have a perfect scheme of defense. We do not. We hope there will come from the Imperial Defense Conference a scheme in which we shall be able to cooperate and do our share. There will be allotted to us our quota and our sphere of operations, and not merely to us, but also to the other dominions. Although we have not done our share in the naval defense of the Empire, as compared with Great Britain, we have more than done our share as compared with other dominions. [Hear, hear!] I trust, therefore, that as a result of the Imperial Defense Council, which, I hope, will take place next year, there will be evolved, for the first time, a real imperial defense policy. We hope Australia will be ready to do her part. We did it gladly and we did it well in war. We shall do it as gladly and, I hope, as well in time of peace.

Naval Expenditure Stated.

I want to quote some figures of expenditure on our naval scheme of defense. The annual expenditure for the past seven years is as follows:

	Pounds sterling.
1913–14	2,001,467
1914–15	7,330,000
1915–16	11,336,000
1916–17	11,433,000
1917–18	7,129,000
1918–19	9,854 000
1919–20	5,633,000

For this year the expenditure is estimated at £3,959,000, of which £710,000 is for transport services, leaving for naval purposes pure and simple an expenditure of £3,200,000. Taking into consideration the value of the pound, I venture to say that we can not be fairly accused of extravagance. We have, in fact, a policy very near the danger point, but we must take some risks. We shall expend at this rate 12/6 a head; in England the expenditure is £1/16/3 a head, three times as much. The army estimate is 12/4 a head, the British figure being £2/13/9 a head, or more than four times as much.

To turn to the air. I am amongst those who believe in aviation. I hope every man has imagination enough for that. To any man of imagination there is something exhilarating and inspiring about this conquest of the last of the elements by man, and it is a splendid thing to think that in the air, as on the land and on the water, Australians have held their own. It is a great thing to think that Australians have made the longest world's flight, and that we have bridged the great gulf between Britain and Australia. Two men did it with one machine, and we have lately seen come here another, a little machine in which some timid people would hesitate to fly from here to Flemington race course, and which yet found its way across thousands of leagues to this country. [Hear, hear!]

£600,000 for Aviation.

The possibilities of aviation in this country are infinite. The ministry recognizes that in the air we may hope to create a force of incomparable service in defending us against an enemy. We have placed on the estimates a sum sufficient for building up an efficient air force. The recommendations upon which the defense

policy is founded are the results of the deliberation of the council of defense, upon which the best of our permanent officers and citizen officers, naval and military, are members. The air force is to be under the control of a board, on which there will be representatives of the Navy, the Army, and civil aviation. A sum will be placed on the estimates to encourage civil aviation, and it is proposed to pass legislation to insure the safety of aviators and citizens. It is proposed to map out routes immediately, mark out landing places, and create petrol depots. We hope to encourage the manufacturer to make engines and aeroplanes in this country, and we shall not hesitate to give a very substantial bonus for that purpose. [Hear, hear!] It is obvious that unless we can repair machines and, if necessary, make them, we may, in an emergency be left in a helpless position. We will appoint a director of civil aviation, who will sit on the Air Board Council. Commercial aviation will afford us that reserve of personnel and machines that in an emergency will be necessary to our fighting forces. In a comparison of the cost of defense, note must be taken that in 1919–20 £1,110,224 of the military estimates was paid for out of the war loan. It is now charged to revenue. It is proposed to place on the estimates £500,000 for military aviation and £100,000 for civil aviation. It rests with the enterprising men to show that it is the duty for the ministry to provide more money. We want to encourage commercial aviation. How far we are justified in cutting down our naval estimates is a matter which the house may have a little leisure to think over. If it was not for the British Navy we should not be here to-night, there would have been no victory, and for Australia no future save as a vassal. The question is not whether we are spending too much, but whether we are spending too little. [Cheers.]

ECONOMIC AND FINANCIAL CONDITIONS IN JAPAN.

Source: Reliable.

(13591.)

With an idea of studying economic and political conditions in Japan I have just completed a three months' stay in that country. My sources of information have been to a large extent verbal, but most reliable. Three years spent in Japan as a boy have given me a number of friends who to-day are among the best-known foreign business men of Yokohama: J. Manchester Poole, manager of Dodwell & Company, and president of the American Association of Japan; Morris Mendelson, a great student of economic conditions; R. Van Smith, among others—all Americans in their forties—who have spent their lives in Japan.

In a commercial way no nation ever had a greater opportunity for development than did Japan during the World War, and she took the fullest advantage of it in the upbuilding of her shipyards and factories. Steel mills for rolling plates, angle iron, and shapes were built to furnish material for the large number of ships that were

laid down. Large munition plants were constructed; her cotton and silk mills were enormously enlarged, and her water power, of which there is an almost inexhaustible supply, was harnessed on a large scale. The Japanese business man, however, painfully lacked perspective; he proceeded on the basis that the war would last indefinitely, and in his procedures followed a course diametrically opposed to that of business men in this country. No surplus was built up for lean years, plants and equipment were not written down, and many companies were recapitalized on the basis of war earnings with the new rich buyers of the stock. Profits were enormous, but were paid out at once as dividends and bonuses to employees. In some cases dividends ran as high as 100 per cent and bonuses to five times the employees' salaries. Money became plentiful and it is estimated that the actual cost of living, which reached its peak in March, 1920, went up to 300 per cent. Speculators appeared in large numbers and their purchases of supplies abroad for speculative accounts were financed by the Japanese banks without question. Contracts were entered into with the United States Shipping Board to build 20 ships, and into the contract was inserted a clause that the builders should deliver the ships to the United States ports, but should have the privilege of loading the ships with cargo for this country, the profit to accrue to the builders. With freight at $40 a ton the builders felt that they could figure on a low building cost and rely on the carrying charges of this voyage for their profits.

The end of the war passed unnoticed and the first shock came in 1919, when Mr. Gary, president of the United States Steel Corporation, announced that future sales to the Japanese account would be for cash. Drastic cuts in ocean rates were announced by the United States Shipping Board and by the British ship comptroller, and this was followed in the fall of 1919 by an energetic boycott of trade with Japan by Chinese merchants. This last was most efficient, and in May, 1920, it was estimated that Japanese trade on the Yangtze and with the port of Shanghai had fallen off 40 per cent. The Shipping Board's vessels began to appear in increasing numbers, not always efficiently run, but eagerly patronized by the foreign exporters, who had had to submit for five years to endless extortion to get their goods moved. The Japanese vessels for the Shipping Board were reaching completion and the cargo that was to pay so handsomely for their building was not to be obtained. The contract required delivery immediately upon completion, and in an effort to get cargo drastic slashing of freight rates were resorted to, until in May, 1920, space on some of these vessels could be obtained for $3 a ton.

So that by May matters reached an acute stage. As mentioned earlier, the banks were financing the speculators most recklessly.

Goods bought abroad were purchased through payment by the United States' banks to the sellers, upon presentation to the banks of their bills of lading; but not until credit for the repayment of these sums had been established by Japanese banks. By the Japanese law goods landed in the Japanese customs warehouses are still in transit and can not be regarded as delivered: and the banks could, therefor, not call upon the speculators for payment of their notes. The speculators finding themselves with no purchasers for their goods, left them in the customs warehouses until in April the docks became so congested that the port of Kobe had to be closed, and other ports were suffering in a lesser degree. I personally made several trips through the huge Hatoba at Yokohama and literally could not see how more material could be placed in the yards; railroad tracks and roadways covered hundreds of barges lying in the basins, unable to discharge. Banks suddenly put up interest rates and denied further credit to the speculators, at the same time bringing pressure on them to liquidate their holdings. Many of these could not meet their obligations and the result was that the banks became the owners of huge quantities of merchandise purchased at prices far above those then ruling, and with the market still falling. Sales of this material were accordingly made regardless of cost, and the day I left Yokohama, July 27, Mr. Root, representative of the large import firm, told me that he was buying wire nails for half the price at which he had sold them to the same people a year before. The failure of Nogi, one of the largest speculators, for 15,000,000 yen, was followed by the closing of the One Hundred and First Bank and by the failure, usually followed by suicide, of dozens of the "narakins" or war millionaires. Cotton, silk, and food prices, artificially sustained, showed a steady drop until in August, 1920, silk, for instance, was quoted at one-third its February price.

To-day, in spite of the strong position of her Government's gold reserve (gold holdings on August 15 were as follows: Government holdings, 892,000,000 yen; Bank of Japan, 1,073,000,000 yen: total 1,965,000,000 yen: at home, 807,000,000 yen: abroad, 1,158,000,000 yen) and her comparatively small national debt, Japan is in a desperate financial position. Her banking credit has been badly impaired, and her shipbuilding plants are rapidly closing up owing to lack of demand for new construction, and a large proportion of her merchant marine is idle for want of cargoes. The increasing production of French silks, English cottons, German toys, dyes, and buttons, and the conversion again to peace purposes, of American steel mills, have either cut hugely into profits or put completely out of business war industries. From a nation whose exports exceeded its imports by 1,539,999,000 yen, for the years 1915–18, Japan's profits have dropped off until for the year 1919 her exports were exceeded

by her imports by 126,419,000 yen, and for the first six months of 1920 alone 480,000,000 yen.

So far financial conditions have not been reflected in any acute economic unrest, but this is but a short step from conditions as they exist to-day. The farmer and silk grower throughout all the war prosperity have enjoyed only a small profit, and to-day, with the drop in the price of rice and of cocoons, find themselves facing a gloomy future. Murmurs from this source have already commenced to reach the acute ear of the Japanese Home Office, and relief measures have been discussed by the Diet, but to date nothing has been done. Large numbers of workers, in shipyards and factories, have been discharged, but have been paid off with four or five months' bonus pay, and so as yet actual want has not appeared as a condition of unemployment. A certain amount of agitation for extension of the suffrage exists, but this is mostly confined to the student class and finds only an apathetic following among the labor element. Labor unions exist, but are usually ineffective in case of strikes or other disputes, as the police authorities invariably take the side of the employer.

The combination of all these factors may easily produce an industrial crisis calculated to cause the Government great uneasiness. In the past, such a crisis has been met by creating a foreign situation that would cause the people to forget their troubles, and Japan's new attitude toward the question of emigration to California, and an insidious campaign of antiforeign propaganda, would point to an anticipation of this problem and its solution on the old lines. Much capital has been made by the Japanese of the so-called Liberty Ministry—but inasmuch as the cabinet ministers are still answerable to the throne and not to the Diet, and the Emperor is merely the puppet of the elder statesmen, who are strongly militaristic, the power still lies in the hands of the Military Party—and for this reason I believe the policies of the past have not been altered.

"Antiforeign" rather than "Anti-American" propaganda was used until within the last three months, when it has seemed to be on the latter of these lines, with the idea in mind always that it could very easily be turned into one channel—against one particular nation—when the occasion arises. Much hostility exists toward all foreigners in the coast cities. The inns and tea houses are reluctant to take in foreigners even for a meal. Pedestrians refuse to get out of the way of automobiles driven by foreigners. The police and lower courts invariably treat with contempt and rule against foreigners in all disputes. The Government has removed all foreign words from the tobacco monopoly signs scattered broadcast through Japan, and has encouraged dealers to do the same, saying that for-

eigners in Japan should know Japanese. In a thousand small ways this spirits shows itself.

Being interested in this subject of propaganda, and curious to see how widespread it might be, I organized with Mr. Mendelson a walking trip through the center of Japan, choosing the country south of Wakamatsu as a section little traveled by foreigners. Mr. Mendelson has been on numerous walking trips, but stated that he was struck with the changed attitude of these country folk. In the place of the old courtesy and smiles we were greeted almost everywhere with sulkiness and silence. It was a subject of great wonderment to Mr. Mendelson, and his frequent remarks on it were original and not suggested by any expression or opinion from me. In one small village, in the midst of the silk region, Yokagawa, we talked to the mayor, who, in the course of the conversation, asked why we foreigners insisted upon ruining the Japanese silk growers, and nothing would persuade him that the fall in the price of cocoons to a level where they could not make a profit was anything but a foreign plot.

About the 15th of June articles attacking the Jones bill began to appear in the Japanese press. Mass meetings of protest against this were organized, and much feeling against us was shown, both at the meetings and in the newspaper comments thereon. The California agitation against the Japanese was at the same time given much space, so that altogether it would seem that active propaganda against this country is already under way.

Physically, except for the development of her water power, Japan has made little progress during the last 10 years. Her railways, telegraphs, and telephones are under Government control and are regarded by all foreigners in Japan as most inefficiently handled. Railway trains are slow, usually late, and invariably crowded. The equipment is old-fashioned and inadequate. Mail, telegraph, and telephone service is bad beyond belief. Foreign mails frequently take from 6 to 10 days to distribute, which may in part be due to a surveillance that the Government still exercises over foreign correspondence. In defense of his department the director of posts stated in May that much of the confusion is due to the constant changing of postal clerks, and that he had a complete turnover in his force every six months, due to the high wages paid outside.

Japan has sufficient coal. Small quantities, almost negligible in case of a war, of iron ore and oil, and not entirely adequate resources of copper. It is believed that in foodstuffs she is not quite self-sustaining, and it is not believed that at present there is any large reserve supply of rice or other foodstuffs in storage. A large

buying movement by Japan of food supplies would be regarded by me as the very best of danger signals. The department of agriculture has made strenuous efforts to encourage a diversification of crops, and has established experimental farms throughout Japan for this purpose. They have succeeded in developing a number of hitherto waste areas with orchards and potato farms, but I do not believe that the increase in food production has kept pace with the increase in population. No figures on this subject could be obtained by me, and I question whether the Japanese Government has made any intelligent study of this subject.

GENERAL CONDITION IN GERMANY.

Source: Commander E. S. Land (C. C.), U. S. Navy.

(9382–h.)

31 August, 1920.

Agricultural Conditions.

Throughout Germany the crops generally appeared to be very good. They might be rated at from 75 per cent to 90 per cent of normal. Harvesting was in progress, and generally the conditions seemed very good for getting in the harvest. In the agricultural districts the people worked from daylight until dark. My impression is that there were two women to every man working in the fields. The working parties included men, women, and children of all sizes and ages. It appeared as if the sugar-beet crop would be below normal, as a considerable amount of the land normally used for this purpose had been used for the potato crop. There was little or no evidence of suffering in the agricultural districts, and, full and by, these districts seemed better off than any of the other parts of Germany.

Industrial.

My estimate of the industrial situation is that it is about 40 per cent of normal. Any manufacturing plants that had anything to do with the manufacture of war materials have naturally suffered great losses since the signing of the armistice and are continuing to suffer through the enactments of the clauses of the peace treaty and by the great shortage of raw material so necessary for industrial purposes. The question of exchange enters very vitally into the importation of raw material and it is of interest to note that even at the present time the exchange sometimes fluctuates 10 per cent from Saturday to Monday. This was probably due to some adverse news from the Polish frontier but nevertheless it tends to show the sensitive condition of exchange in Germany. Naturally this has a direct reaction on the importation of raw material. I ran across a number of Americans and also quite a number of other outside business men

who were endeavoring to negotiate for business. The American business men stated that it was rather difficult to accomplish all that they desired in a business way but that some progress had been made and that more progress seemed probable.

Political.

The Government is supposed to be reasonably stable, but it gives one the impression of being in neutral equilibrium. The Government to have a majority requires the support of the three central political parties, which forces the extreme right and the extreme left to be in opposition, and while these extremes have little or nothing in common, there were rumors that they might bury the hatchet long enough to make trouble for the Government. The defection of one of the central parties might leave the Government in the minority at any time. These comments are made on the basis of there being five important political parties in Germany at the present time, and without making any effort to name them or to separate them.

The Reichstag to-day is made up of the following parties, the number of representatives following each party:

Extreme Left	2
Independent Socialists	81
Majority Socialists	112
German-Democratic	45
Zentrum (Catholic)	68
German Peoples	62
Scattered Parties	30
German National	66
Total	466

One might compare the Extreme Left to the I. W. W. in the United States; the Independent Socialists to the radical labor element; the Majority Socialists to the Gompers labor element; the German Democratic party to Hiram Johnson followers; the Zentrum is the Catholic Church Party; the German Peoples Party to the high-tariff elements; and the German National Party is the Monarchi Party. The German Peoples Party has leanings toward a monarchy.

Each day that the Government continues gives it added strength and stability, although at any time some emergency problem may arise that might result in the overthrow of the Government.

Navy Department.

The War Department and the Navy Department are combined under a Ministry of Defense and have their headquarters in one building in Berlin. The plight of German naval officers is a rather pitiful one in many ways. They are practically on the blacklist

throughout the country, and as there are only about 10 per cent of them still in the service it can readily be seen that they have very little power or influence. Those on the outside are having troubles of their own to get along, and it is understood that quite a number of them have gone to South America, a few to Japan, and others to parts unknown. These naval officers might naturally turn to merchant-marine work, but in view of the fact that naval officers were on the subcommittees or advised those who signed the armistice and the peace terms the merchant-marine official has no use for former naval officers. This is on account of the fact that so much merchant-marine tonnage was allocated to the Allies.

Food and Prices.

It is practicable to obtain almost any kind of food and in almost any quantity if you are willing to pay the price. There is, however, a real shortage, milk being the most noticeable. Butter, sugar, fats, meats, etc., are also very difficult for the middle and lower classes to obtain in anything like satisfactory quantities. Prices generally vary in the wildest degree.

A double room and bath in the best hotel in Augsburg could be obtained for 26 marks; the same room in a similar hotel in Munich was 175 marks, and in Berlin 250 marks. A satisfactory luncheon could be obtained in Berlin for from 3 to 100 marks.

Bolshevism.

There is undoubtedly a great fear of Bolshevism coming over from the Russian or Polish border. The middle classes worry over this more so than do the other classes. Opinions vary widely as to whether Bolshevism would ever get a real hold on the stolid German nature. The possibility of trouble from this source seems doubtful, at least at the present time. With good crops and harvest time it seems doubtful that the agricultural people would join in a movement for Bolshevism; in fact, it is considered that they would resist any such movement, for by joining such a movement they would lose their crops and the crop material that they have accumulated in their houses, barns, and cellars. There is undoubtedly a general feeling of pessimism thoughout Germany. The German people are discontented over the peace treaty, and it is a very noticeable fact that they have not learned the lessons that one would expect them to have learned. In their complaints it is noticeable that they have overlooked entirely the precedent that they themselves established in 1870. Many of the people of Germany show a great lack of foresight as well as hindsight. It is easy to understand the one but difficult to understand the other. Apparently their natural characteristics are such as to cloud their reason and befog their vision.

Profiteering.

Undoubtedly there is the same sort of profiteering going on in Germany as in other countries. Probably the degree of profiteering is greater in Germany than in other countries. The general result seems to be that the middle classes suffer more as a result than do the other classes.

Malnutrition.

There was some evidence of malnutrition in the children of the lower classes in Germany. It was stated by a German-American who owns the Atlantic Hotel in Chicago that he had made an inspection of a number of the hospitals in Germany and though he found a number of cases of malnutrition relief work was under way. Children have been divided into three classes and are fed according to their classification needs. It was stated that excellent work was being done by the Quakers in this form of relief. Other organizations are also doing good work. Malnutrition is readily understood when the extreme high cost of living is taken into account. An outsider does not appreciate this as he measures the cost of living in his own money rather than in the mark. Again, an outsider is able to live more cheaply in Germany than he would in England or America, provided that his income is derived from those countries.

Feelings Toward Foreigners.

The general feeling toward Americans appeared to be friendly and the Germans are anxious to do business with us at the earliest possible date. The general feeling toward the British was somewhat anaolgous to that shown toward the Americans, but some of the educated Germans have very bitter feelings against the British. There appeared to be a sort of neutral feeling toward the Italians. Naturally the feeling toward the French ranges all the way from passive to very bitter, with a tendency toward the latter.

Berlin Versus Munich.

In view of the many statements appearing in many newspapers relative to the gayety in Berlin, it is of interest to compare the cities of Berlin and Munich. The difference between the people and the life of the two cities is very noticeable. Berlin is no more representative of Germany than Paris is of France or New York is of the United States. There is undoubtedly a great deal of simulated gaiety in Berlin; this has always been true, and the conditions there at the present time vary but slightly from those that existed in prewar times. One gets the impression that the inhabitants of Berlin spend most of their time in eating and drinking in the various coffee houses and cafés. Undoubtedly there is some truth in this impression, but a closer investigation will show that considerable less money

is being spent at the present time than was the case in prewar times. No doubt but that the same amount of time is spent in the cafés, etc., but the amount of money spent is less. The general moral conditions existing in Berlin have been much discussed and severely criticized. These conditions are accentuated by the reaction from the war and by the lack of work in Berlin. It has been said, however, that similar conditions existed before the war and that the whole matter is but a question of degree. In comparing Munich with Berlin, one certainly gathers the impression that Munich is a much more civilized, better behaved, and better acting place and that the people are attending to business and working much harder than they are in Berlin. One is much more favorably impressed by the general atmosphere of Munich. General living conditions are undoubtedly superior in Berlin than they are in Munich.

Demonstration in Berlin.

On the 18th of July a demonstration took place in the Lustigeplatz at about 11 o'clock in the morning. This demonstration consisted of an assemblage of from ten to twelve thousand people, who were harrangued by eight or ten "orators" from the steps of the various buildings surrounding the Lustigeplatz. There was one orator for each 1,000 people, and they grouped themselves accordingly. Red flags were numerous and particularly so in the vicinity of the orators. A great many signs were carried. On these signs were printed protests against the increase in rent rates. The demonstration lasted for an hour and was a protest against the rent rates for houses, flats, etc., in Berlin. At the conclusion of the demonstration the assembled multitude marched off in groups and dispersed within a few blocks of the Lustigeplatz. While all of this harrangue was not understood, a German-American of socialistic tendencies stated that all of the oratory was of that type, that there was little just cause for complaint, and he was of the opinion that the oratory would have but little weight or effect on the people.

Miscellaneous.

The former Government (1914–1918) was severely criticized and condemned.

German naval officers still think that they won the Battle of Jutland.

The desirability of an additional German army force on the East German front to prevent an overflow of Bolshevism is admitted by most thinking people in Germany, whether they be Germans or foreigners.

SUPPLEMENTARY BUDGET, 1920–1921—JAPAN.

Source: Reliable.

30 September, 1920.

(12581–A.)

The following items of the supplementary budget deserve notice:

	Yen.
FOREIGN OFFICE:	
9. Secret fund	720,000
WAR OFFICE:	
19. Secret service fund	500
(This item is ridiculously low, and, of course, is really much larger than shown.)	
DEPARTMENT OF HOME AFFAIRS (ordinary):	
K. Government guarantees and subsidies	9,342,180
DEPARTMENT OF HOME AFFAIRS (extraordinary):	
(A)	
6. Working expenses, Harmony Association (capital and labor)	2,000,000
(F) Colonization—Hokkaido	6,756,835
(N) Encouragement of chemical manufacture	2,115
(This is not much, but the recent large increase in import duty is the best encouragement).	
Investigation of social undertakings and local systems and conditions	102,296
DEPARTMENT OF FINANCE:	
(U) Special news service from abroad	100,000
(This is probably financial and economic news, though not certainly so.)	
NAVY DEPARTMENT (extraordinary):	
(F) Completion of armament (cost of warships)	89,391,224
(S) Renewal of smokeless powder	2,807,508
Continuing accounts.	
HOME AFFAIRS:	
Maruyama River improvement to 1929	5,000,000
Ishikara (Hokkaido River) to 1932	17,338,000
Hokkaido port and harbor improvements to 1927	14,094,799
Construction of Akabane-Tonegaure-Kuribashi Highway to 1922	6,666,900
WAR DEPARTMENT (equipment for national defense):	
Construction, repair, and surveys	300,799,382
(To be spent at an average of 5,000,000 yen per year until 1927, and then at an average of 45,000,000 yen per year until 1933.)	
Readjustment and building of forts	135,548,341
(To be spent before 1931.)	
NAVY DEPARTMENT (total appropriation):	
Construction of warships	1,765,954,127
Spent	596,084,404
Remainder	1,169,869,723
(To be spent at an average of 180,000,000 yen per year for 1920–1923 and at an average of 112,000,000 yen a year until 1927.)	

NAVY DEPARTMENT (total appropriation)—Continued.

	Yen.
Equipment on land and sea:	
Total appropriation	214, 139, 324
Spent	66, 659, 067
Remainder to be spent by 1927	147, 480, 262

DEPARTMENT OF AGRICULTURE AND COMMERCE:

Fund for developing iron foundries:	
Total	93, 231, 401
Spent	69, 725, 383
Remainder	23, 506, 018
(This is to be spent by 1922.)	
Extension of telephone exchanges	291, 900, 000
(To be spent by 1927.)	
Improvement of communication	73, 800, 000
(To be spent by 1926.)	
Department of railways	1, 419, 298, 382
(To be spent by 1929.)	

Special accounts.

CHOSEN GOVERNMENT:	
Police affairs, including uniforms, etc	1, 999, 216
(This is one of the biggest items in the Chose Supplementary Budget.)	
DEPARTMENT OF COMMUNICATIONS (Japan):	
Ship subsidies, 1921	3, 934, 511

COMBAT—AUSTRALIA.

Source: Reliable.

28 September, 1920.

(12517–A.)

44—PEACE (*b*) ADMINISTRATION:

Military expenditures for 1920–1921=£3,250,000, with £600,000 for aviation, civil and military.

Naval expenditures for 1920–1921=£3,960,000, with £700,000 for transport.

New Defense Program.

42—FIRST LINE:

(*a*) Regular Army—

Peace establishment to be 130,000.

2 divisions light horse.

4 divisions infantry.

3 brigades able to unite in a fifth division.

46—MOBILIZATION:

(*a*) Processes—

Voluntary enlistment revived.

Universal training retained (4 years commencing 18th birthday). 16,000 boys for year.

56—INDIVIDUAL:

(*a*) Length of service—

4 years commencing on 18th birthday.

(*c*) Elementary—

Boys 14 to 18 to have 10 weeks' training first year and 16 days each year thereafter. Training to be physical and recreational and boys to be issued athletic kits instead of uniforms. (All citizen forces to have 8 days' training this year.)

Voluntarily enlisted youths to get 16 days annual training for 4 years.

57—UNIT:

(*a*) Division—

Division commander to have complete responsibility for preparation for war. (All the above is from the Evening Standard, September 17.)

Australia—Naval Power.

The matter below is from a statement of provisional naval proposals by Sir Joseph Cook, Minister of Navy, in Times of September 24.

68—SHIPS:

(*a*) Types—

6 submarines.

6 new destroyers.

2 sloops.

1 light cruiser, the *Brisbane.*

1 training cruiser, the *Sydney.*

The *Australia* to be kept with nucleus crew for gunnery and torpedo drill. The *Melbourne* with nucleus crew for flagship.

74.—SAILORS:

(*b*) First line—

Maximum 6,828 (compare with 3,837 prewar), to be reduced to 4,651 by June, 1921.

(*c*) Reserves—

A Naval Reserve to be provided to complete necessary number. There is also to be a Royal Australian Naval Fleet Reserve composed of ratings who have left the service to do short periods of training each year. Also a Volunteer Reserve.

92.—INDIVIDUAL:

A.—Navy—

(*a*) Period of service—

For ratings to be increased from 7 to 12 years.

(*b*) Advanced schools—

Highly qualified specialist ratings to go to England to train.

FRENCH MILITARY MISSION TO BRAZIL.

Source: Reliable.

(13449.)

9 September, 1920.

September the 8th marked the conclusion of the first year of work by the French Military Mission under Gen. Gamelin in the reorganization of the Brazilian Army and the instruction of its officers.

The event was made the occasion of a very cordial meeting between the Brazilian Minister of War, officers of the General Staff and Brazilian officers under instruction on one hand, and Gen. Gamelin and the officers of the French Mission on the other. Col. Nestor Sezefredo, director of the General Staff School, made an address, very highly complimenting the officers of the French Mission in recognition of the excellent work which they had accomplished.

Inquiry here has indicated that, whereas there was considerable resentment against the mission during the early part of its labors here, this feeling has largely disappeared and is being replaced by a sentiment of appreciation of the good results being obtained in the matter of reorganization of the Brazilian Army and education of its personnel.

Information from an excellent source indicates that considerable resentment against the French Mission is still felt amongst officers of the Brazilian Army. This opposition arose from two causes; first, just prior to the outbreak of the war in Europe a contract had been drawn up between Brazil and Germany for a mission of German officers to be brought over for reorganization of the Brazilian Army exactly on the lines of the present French Mission. Naturally those officers who were interested in the efforts to secure the German Mission were opposed to the French one. To this is added the fact that a considerable number of the older officers resent any criticism of the existing conditions or any effort to change them.

The mission, however, has secured the good will of most of the officers who have passed through the course of instruction under the mission. These officers have realized the serious lack of organization and equipment of their army according to modern standards, and many of them are eager to remedy the existing conditions in order that the army may be placed on an efficient basis.

As an example of the need for reorganization may be cited the fact that the Brazilian Army has not possessed any organization corresponding to our Quartermaster Corps. The duties of such a corps have been carried out by a small organization headed by a colonel of the line detailed for the purpose.

SUBMARINES.

GERMAN SUBMARINES AND SUBMARINE WARFARE.

Source: A Pamphlet Found on the ex-German Battleship "Ostfriesland."

(13579.)

31 August, 1920.

[The following is a free translation of a pamphlet entitled "Submarines and Submarine War." The pamphlet was written by an officer who had extended experience during the World War. The article contains a few items of technical interest and some rather interesting points relative to the German idea of the United States and their part in the war, together with considerable data relative to the submarine campaign and its effect upon the British Isles.

The weapon of greatest interest to the German nation at the present time is the submarine. It is still expected that the submarine will put a speedy and victorious end to this war, which has already lasted for too long a time. During this war innumerable articles have been written and various discussions have taken place concerning every possible event, and such thrilling and terrifying tales have been related about this weapon that we ourselves shrink with terror when we hear of the sufferings caused thereby. It is really not so bad. Our battle position is most important, and naturally our privations, dangers, and losses correspond thereto. I, as an expert, am able to give you correct information on this subject, for until the present time I have been on U-boats for the greater part of the war, first as a watch officer on the U–28 under the command of Senior Lieutenant Baron Von Forstner, whose name is perhaps known to you through his short paper entitled "As U-boat commander against England," and later as commander of my own boat.

First of all, I shall tell you something of the technical construction of our boats, their use, and our work in foreign waters, and also a few remarks on the political significance of the U-boat in this war.

The vital part of every U-boat is the so-called pressure body. Any object that is thrown into the water sustains, in addition to the normal atmospheric pressure on the surface of the water, the pressure of the column of water pressing down on it—that is, for every ten meters depth of water there is one kilogram of pressure to the square centimeter. If a hollow body is constructed inside

of which men are to live and to work under normal atmospheric pressure, the walls of that body must be sufficiently strong to sustain a corresponding water pressure. In practice we have often found that objects inadvertently left on the deck before submerging—for example, spyglasses, cartridge cases, etc.—were found to be completely crushed upon emerging. The walls of our U-boats are now built to withstand a pressure of 50 meters of water. A number of U-boats in cases of necessity have withstood greater pressures. The German, as is always the case in his scientific experiments, has been very thorough in his construction of the U-boat. The U-boat does not submerge to a greater depth than 50 meters unless it is necessary to do so. Outwardly the pressure walls of the U-boat resemble the shape of a Zeppelin. Doubtless you have seen in large airships the fore and aft rudders projecting from her sides; similarly in a U-boat, the fore and aft rudders project in pairs from the pressure hull and are worked from within the boat.

Preliminary to diving the boat attains a fairly good speed, the fore rudders are inclined downward, the after rudders upward, and the boat through the action of the water on the hydroplanes submerges. Care must be taken that the boat is neither nose heavy nor tail heavy. The required depth having been reached, the exact water pressure may be read from the gauges. The submerged U-boat is now navigated with the aid of the depth gauge and the inclinometer. The normal condition for our U-boats is for cruising on the surface. U-boats submerge only when it is desired to attack or when the boat is in danger. When on the surface U-boats have positive buoyancy the same as other ships. If the boat submerges part of this positive buoyancy is lost. To accomplish this U-boats are fitted with tanks, called diving tanks; these tanks are empty when the boat is on the surface. When the boat is about to submerge these tanks are flooded, thus adding the necessary weight required for submerging. With these tanks flooded the boat still maintains some of its buoyancy, otherwise it would sink like a stone. It might be necessary to lie on the bottom and for this purpose there are installed additional tanks that may be used for this purpose. The purpose of these tanks is to trim the boat at different densities; for example, the trim of the boat would be effected when passing from salt water to fresh water or vice versa, and again in midocean the density varies as a result of currents, etc. The U-boat is held to its course by a vertical rudder the same as any other ship.

Different types of engines are used for the propulsion of the U-boats. On the surface the "Schwerol-Verbrennungs" or Diesel motors are used. In these motors the air is very strongly compressed and heated; the fuel is then mixed with it, thereby causing ignition and the motors to operate. Contrary to automobile and airship

motors our Diesel motors do not have an ignition installation, which is the cause of many mistakes. The motors utilize a large amount of air, which can only be obtained from the atmosphere when on the surface. When on the surface a dynamo engine is connected up with the propeller shaft and the current produced by this dynamo is stored up in an accumulator battery. When the boat submerges the current to be utilized for the propelling force of the boat is taken from this battery. In other words, when the boat is on the surface the propelling force is derived from the Diesel engines and when submerged the propelling force is derived from electric motors. The number of these engines varies with the size of the boat. A knowledge of the condition of the batteries is one of the most important duties of the U-boat commander. When the boat cruises submerged at a high rate of speed a larger amount of current is used than when cruising at a low speed. Electric current is also used for auxiliary purposes such as engine auxiliaries, electric lighting, cooking, etc. All lighting inside the boat must be protected, as an explosive gas is formed by the discharge of the batteries and a naked flame introduced into this medium would probably cause an explosion. Cooking and smoking are forbidden inside the boat. When submerged all the hatchways are naturally battened down, even that of the conning tower, and so it is only possible to smoke there when on the surface. When the sea is somewhat rough even there the spray douses the cigar and then there is no other place to smoke, which makes it somewhat hard for the old sea dog who has become so accustomed to his "Knosel."

The eye of the U-boat while submerged is the periscope, or as we say in German the "sehrohr." The "sehrohr" is a long cylindrical steel pipe through which by a system of mirrors objects on the surface are projected down into the U-boat. The construction of the periscope is similar to that of the ordinary field glass or telescope used on land. Only one periscope is used at a time, the second one being held in reserve.

The commander is the only person that looks through the periscope, the rest of the crew are unconscious of what is going on above the water. When on the surface the periscope is completely housed, when submerged it is raised and lowered by means of a small electric motor. When the sea is smooth the U-boat, when submerged and with the periscope up, is betrayed by a small streak of foam that gathers around the periscope. Because of this the commander only keeps the periscope above the water for as short a time as possible, he takes a look around the horizon, takes the bearing of any possible opponent, ascertains his course, and then houses the periscope.

The armament of the U-boat consists of the torpedo, medium-caliber battery, machine gun, small arms, and revolvers. A certain

type of U-boat carries mines instead of torpedoes. The chief weapon, however, is the torpedo. Before the war the U-boat carried only torpedoes. Unlike the shell that is fired from a gun by means of the pressure formed by the ignition of powder in the powder chamber the torpedo is discharged from its tube by an impulse of air. The torpedo then continues its journey under its own power. A torpedo may be compared to a U-boat. It has its own engine, its own auxiliary machinery for controlling the movements of the vertical and horizontal rudders. The head of the torpedo is filled with an explosive charge which is exploded upon hitting the target by the action of a detonator. The engine is a multicylindered one, but is operated by compressed air instead of steam; otherwise its operation is similar to that of a steam engine. The torpedo tube is not movable as is the case with a gun, but is built firmly into the structure of the boat. The torpedo then may only be aimed by changing the course of the boat itself. In aiming the torpedo the following elements enter into the problem: speed of the target, course of the target, your own speed and course, and also the speed of the torpedo. Especial training is therefore needed in the firing of torpedoes. In spite of these difficulties the percentage of hits with torpedoes is greater than that with guns. The torpedo is a costly weapon, being valued at several thousands of marks.

A number of our U-boats were built as mine layers. The forward part of the mine-laying submarine is fitted with a number of perpendicular cylinders projecting through the hull. The mines with their anchors are kept in these cylinders. The mine itself appears as a pear-shaped object, one part of it containing an explosive and the other part of it air, the air being necessary to give the mine the required buoyancy. When released the mine and the anchor sink together to the bottom of the sea. After a predetermined period of time the mine automatically releases itself from the anchor and takes a prescribed depth underneath the surface of the water.

Almost all of our U-boats have one or more big guns. The guns are installed on the deck of the boat a short distance above the normal water line. The gun crews often stand waist deep in water. Men have sometimes been washed overboard by the action of the seas, but as a general rule were hauled abroad again with a bowline. The ammunition is stored partly on deck and partly below deck. In most boats there is a row of ammunition under the bunks of the crew, in fact, all available space is utilized on the U-boat. As a protection against aircraft, machine guns are supplied to the U-boats and these may be quickly brought into action.

On the smaller U-boat there is only one officer but on the larger boats the commanding officer has two or three assistants, two for

watch standing and one for engineering work. The number comprising the crew of a U-boat varies with her size, the crews of the smaller boats consisted of about 15 men. The deck force and the artificer class are distinguished by different markings on their uniforms, the former having gold buttons and the latter silver ones.

The accommodations are primitive and it is only on the larger boats that the officer has a stateroom separated from the crew. There is a berth for each man, but to economize in space a member of the crew that has been relieved by another uses his berth. Hammocks are swung between the oil-dripping engines and the torpedoes. It is impossible to stand erect. The food, of which there is sufficient, is, of course, all preserved. A supply of fresh meats and vegetables for two days only can be taken aboard because of lack of refrigerating apparatus. But all in all from a sanitary point of view the crew are better off than most people would believe. When submerged the crew can breathe without difficulty for a period of three or four hours. After that length of time has been passed in a submerged condition the air is pumped through potash by means of fans and is thus purified. Oxygen gas, which is stored in steel containers, is but seldom used. The oil fumes from the engine that penetrate every corner of the boat are very unpleasant, and when combined with the smell of mutton and cabbage one may easily understand why "Hammelkohl" is not so well liked. There is no doctor on board. Severe wounds are rare, for if the U-boat is struck by a shell or a torpedo the chances are that the services of a doctor would be of no help. For small wounds a small medicine chest must suffice and in its uses a noncommissioned officer has been instructed.

The missions of the different boats vary with their size. Thus in Flanders we have small mine-laying boats, jokingly called "Knurrhahn" (Heathcock), that lay their eggs only in the Thames or neighboring harbors and return again within a few days, and then there are the large U-boats that are able to maintain themselves in foreign waters for months at a time.

In the earlier part of the war the conduct of the U-boats was similar to that of other types of war vessels; that is, they attacked only the men of war of the enemy. Soon after the beginning of the war, however, the cruisers *Emden*, *Karlsruhe*, and a few others began to prey upon the commerce of the enemy. Toward the end of 1914 the U-boats were able to elude the British forces and, gaining the open sea, began to follow the example set by the cruisers. Cruisers and U-boats followed the dictates of international law in so doing. As laid down by international law the commander of any war vessel is permitted to stop any merchantman in order to ascertain if that merchantman is violating the laws of neutrality. The U-boats usually carry out this procedure in the following manner, viz:

A shot is fired ahead of the bow of the ship that it is intended to search and at the same time a flag signal is hoisted which signifies, according to the international signal book, "Stop or I fire." As a rule all merchant ships stop at this warning. Only upon disobeying this order does the merchant ship lay itself open to direct fire. By means of similar signals the commander of the merchant vessel is ordered to come alongside the U-boat, using a small boat for this purpose and bringing with him the ship's papers and the bill of lading for examination by the commander of the U-boat. From an examination of these papers the commander of the U-boat is able to determine whether the merchantman is or is not violating the laws of neutrality. In cases where the laws of neutrality are being violated the best procedure would be to convoy the confiscated ship to port in order that the cargo might be placed at the disposal of the nation. In some cases our U-boats have done this; for example, the U-boat that I commanded convoyed two Dutch steamers in to Zebrugge. Both of these steamers were bound for London. The S. S. *Zaanstrom*, which I captured, had on board a number of Belgians and Frenchmen that were on their way to join their colors and in addition carried a cargo of 300,000 kilos of eggs. It was shortly before Easter and as a result of this prize the army in Flanders was able to enjoy Easter eggs. In most cases, however, this was impossible, especially for the cruisers that were operating on the American and Asiatic coasts and for the U-boats that were compelled to break through the English line of defense before gaining the open sea. This eventuality was foreseen and commanders of men of war were ordered, when convinced of the impossibility of bringing their prizes into port, to sink them and also to sink any neutral that carried cargo over half of which consisted of contraband of war. This activity was soon very unpleasant for England, as she received a large amount of her war material from America. They conceived many ways of destroying the U-boat and the American inventor, Edison, still tries every week to invent something new, but thank God they have found nothing as yet. There was no honorable way of destroying them, so the English, as usual, resorted to deception and cunning. They placed guns on their merchantmen and so made it impossible to examine their ships according to the rules laid down in international law.

Before the war it was the general opinion that a ship armed with guns was classed as a man of war. The English, however, desired that all neutrals should consider these armed vessels as merchantmen, for if they were considered as men of war they would only be allowed to stay 24 hours in the port of a neutral. This time would be insufficient for loading and unloading. If America had taken the view that these armed merchantmen were men of war she would

have deprived herself of millions of dollars. The businesslike American, however, paid no attention to the dictates of international law, and in beautiful words recognized these ships as merchantmen. Further acts of deception were evidenced by the fact that their ships flew false colors and whenever possible the ship's papers were counterfeited. The meanest kind of deceptions are used when it comes to our U-boats; for instance, there are the cases of merchantmen that fly neutral flags and have a number of guns installed in hidden positions. The U-boat on coming to the surface in order to examine the vessel, as provided for in the rules of international law, is suddenly fired upon at very close range. I myself had such an experience, and I believe that it was the first event of that character after the Baralong and the Crompton affair. In January, 1917, shortly before the declaration of unrestricted submarine warfare and while in the vicinity of the Channel Islands, I sighted a large Danish merchantman. It was flying a large Danish flag at the stern and had the Danish colors painted on her sides. The vessel complied with the signals that I hoisted and lowered a boat in order to bring the vessel's papers to me for investigation. After the "Baralong" experience I lay to at a safe distance from the merchantman, and I stood on the weather side of my ship, but the small boat from the merchantman did not seem to make much headway against the wind and sea, although a powerful stroke was apparently being pulled. Unless I was content to allow the ship to proceed, it would be necessary for me to approach closer to the merchantman. This I did. Suddenly, when within 400 or 500 yards of the vessel a number of ports were lowered and a salvo from five to six guns was fired at me. In spite of this heavy firing the hull of the U-boat was unharmed, and I succeeded with the excellent cooperation of the crew in submerging in a very few moments and of successfully reaching my home port. One may well imagine how furious I was after such an experience as this.

After such experiences as this it was impossible for the U-boats to any longer follow the rules of international law. Either Germany must give up the U-boat, the weapon that hit England the hardest, and thus allow the United States to send unlimited supplies to England to be used against our brave Army in the west, or she must devise other measures against England, who was the first to overstep the rules of international law. It was announced to all neutrals that any merchantmen discovered in a certain zone surrounding England and extending to the high seas would be suspected of carrying contraband. All honorable seafarers were warned to keep clear of this zone. Ships would no longer be warned according to the rules of international law but would be sunk without warning by a torpedo.

The methods of the English in attacking our U-boats, as I have said before, were numerous. These attacks have, of course, cost us a number of U-boats. One of the methods used by the English is to utilize the services of a number of small fast boats that appear but little more above the water than the U-boat. At present they are trying to destroy the U-boat either by gunfire or by ramming. If the U-boat succeeds in escaping by submerging they throw depth bombs over the place where the U-boat actually submerged. Depth bombs are devices containing a large amount of explosive which is exploded by the action of a detonator at a prescribed distance below the surface of the water. These depth bombs are very destructive and oftentimes a U-boat is chased for hours by an enemy ship carrying depth bombs. It is understood, of course, that mines are as dangerous to any vessel as to the U-boat. The submarine net is another method employed by the English to trap submarines. This net is usually laid in narrow channels but even this protection gives them no rest from the U-boat plague as the U-boats find their way in either above or below the net. It is, however, embarassing for the U-boat if she does accidentally happen to run into one of these nets as they get tangled up in the propellers and make it impossible to maneuver the boat. As a rule U-boats have succeeded in freeing themselves from these nets. Some of these nets have mines made fast to them which if struck by a U-boat explode, thus seriously damaging or destroying the boat. Of late the English have attempted to protect their merchantmen by the convoy system. In this system 10 to 20 steamers proceed in company and are surrounded by a number of men-of-war such as destroyers, patrol boats, trawlers, and oftentimes aircraft. You all know from the report of our General Staff how many of the enemies merchant ships have been destroyed even though protected in this manner. In one case the commander of one of our U-boats destroyed all of the merchantmen in one convoy. I can see now the stupid faces of the English destroyer commanders when one boat after another was sunk right under their noses.

In conclusion, I would like to say a few words concerning the political significance of the U-boats during the present war. What really is the mission of the U-boats during this war? One often hears the opinion that it is the desire of Germany to starve out England. That opinion is not altogether true. Hunger and the necessity of rationing foodstuffs is of only secondary importance. The real mission is to so reduce the shipping of England that she will be no longer able to carry on the war. England is an island kingdom that has a very large population and is therefore dependent upon her imports to live. She must import 80 per cent of her needs. If it were possible to destroy the shipping of England, then four-fifths of her population

would be without means of livelihood. What our railway system means to us so does England's shipping mean to her. You all realize that it would be impossible for us to carry on this war if it were not for our railway transportation system. By July, 1917, we had succeeded in sinking 5,000,000 tons of English shipping. One statistician compared the amount of goods so destroyed to the goods carried by a railroad train stretching from Berlin to Bagdad. If our railway trains were destroyed in such proportion, you can conceive how impossible it would be for us to carry on the war for any length of time. Thus, with England, it is her ship's holds that we must fight. Several points of organization and morals enter into the question—a good organization may delay England's downfall two months, a bad organization may hasten it by two months. I shall attempt to show you with the aid of a few figures just how bad the condition of England really is.

On 1 February, 1917, England had, according to her own figures, 19,500,000 tons of her own and Allied shipping. Of this tonnage England supplied only a small part. First, we must deduct the tonnage that is used only for coastwise shipping. That amounts to about 1,500,000 tons, thus leaving 18,000,000 tons of shipping. The greatest part of this tonnage is used for transporting supplies to the English armies from England and America, and in connection with this it should be remembered that England is compelled to supply her armies in Saloniki, Egypt, Syria, and Mesopotamia. It should also be borne in mind that a trip between England and France consumes much less time than a trip between England and Egypt. For the exclusive use of the army we will place, using the figures of the English, 10,500,000 tons. This would leave 7,500,000 tons of shipping for the use of the people in England. To this should be added about 3,500,000 tons of neutral shipping that is forced to carry supplies for her through coercive measure. Thus it is seen that on 1 February, 1917, there were 10,750,000 tons of shipping carrying supplies between England and her overseas dominions. Our U-boats have attacked this shipping for the past year and a half and have sunk nearly 10,000,000 tons of shipping. How have the English tried to protect themselves against this approaching fate? First of all, they should have tried by every means possible to replace these losses.

After the declaration of unrestricted submarine warfare the United States went over to the side of our enemy. Many anxious souls then thought that all of the German shipping interned in the United States ports would be confiscated and used for the transportation of supplies and that the U-boat campaign would be useless. However, the greater part of this German shipping was made useless to America, as the crews of those vessels had so damaged them as

to make them practically worthless. The repairs required to make them shipshape would be considerable, thus consuming time, and in some cases the ships were damaged beyond repair. Actually at the present time 700,000 tons of this shipping is available for the Allies. That is a little more than we sink in one month, so that America has, in the opinion of some of our pessimists, prolonged the war for a little over a month.

When a ship is convoyed, or when seen at night, it is next to impossible for our U-boats to determine the type of cargo carried. Who knows if by this time Germany would not be crushed if she had not used her U-boats with all possible severity against England? America has not brought any too much tonnage to England, so that England must by her own efforts endeavor to fill up the gaps. The cry of Lloyd George, "Ships! Ships!" is characteristic of the English endeavor. That their expectations have not been reached is shown by the following example: In the autumn of 1916 the English Minister of Shipping promised in Parliament to bring English shipbuilding to its height, and that in the second half year at least 500,000 tons would be produced. Actually the shipbuilding for the year netted England 582,000 tons, so you see that just half of this promise was fulfilled. By strenuous efforts the English succeeded in building 1,160,000 tons in 1917. Of that tonnage it is not known, however, the amount used for inland and coasting navigation. English shipbuilding suffers, as does every other English industry, as a result of the U-boat war. Workmen are scarce, as the army demands victim after victim. American shipbuilding is a minimum, and, in addition, the Americans have never been good seamen. Before the war there was not a first-class American shipping line between America and Europe. America's annual production before the war was about 300,000 tons, which amount of tonnage would be sunk in about 14 days by our U-boats. Assuming that England and America accelerate their efforts so that they may produce 3,000,000 tons annually then so long as the monthly sinking by our U-boats do not average less than 250,000 tons, the total tonnage of their shipping will be gradually decreasing.

I have already stated that the English efforts against the U-boat are having no direct effect. To be sure, our losses are sometimes heavy and painful and especially so to experienced officers and crews, but the tonnage of our U-boat fleet is constantly increasing and more officers and men are being pressed into the service.

The English Government is unable to conceal her shipping losses. To insure a decrease in her losses she must take still more stringent measures than those now in vogue. She must limit the export and import of her living necessities that the shipping situation for her

may be eased and she must try to produce more from her own soil. Permit me to give you a few examples as to how restricted imports work out in this country. First, the importation of woolen stuffs is restricted, as is also iron ore, wood, leather, and paper. Before the war England imported a great deal of cotton—more than Germany, Austria, France, and Switzerland combined. You may therefore imagine the great cotton industries in England that are now lying idle. Of course, our industries have also suffered from the lack of raw materials, but such deprivations in our country, so rich in mineral, has a lesser effect than such a scarcity would in England. England obtained more than half of her iron ore from Spain and Scandinavia; the remainder she produced in her own country. The foreign ore is more pure than the English ore, and so you all will imagine the difference that this makes in the steel production of England. Previously the so-called acid process only was used, but now only the Thomas process is possible. This change demands a large number of machines from America, and for this material a great deal of shipping space is required; thus it is easy to see how restriction effects England.

Formerly wood came in the form of "grubenholz" from Scandinavia and Spain and was changed in the "erzbergwerken" of England. The import of this material is now seriously handicapped. "Grubenholz" has to be taken from the forests, and for this purpose suitable machines have to be built, and in addition to this the workmen are beginning to show signs of discontent against the Government. The supply of wood can no longer be guaranteed if the restriction on imports continues. Endeavors in home production have also been futile. In 1916 the cultivation of parks, woods, and meadows was urged upon all classes of people, but land that has not been under cultivation for hundreds of years can not become productive in the space of a few months. The agriculturists of England are unable to overcome this handicap. England produces only 19.5 per cent of her required supply of wheat and about 25 per cent of her required supply of fat. England produces about 50 per cent of her required meat supply, and this is due to the fact that her cattle raising is well done. On the other hand, the raising of cattle requires fodder and the latter requires cargo space. Again, the number of men available for agricultural purposes is far below normal. So all in all the production for the year 1917 will amount to but little more than it did for the year 1916.

With the above-mentioned examples I think that I have shown clearly how near is the approaching fate of England. Our U-boat campaign is a wonderful success and of that fact all U-boat people are confident. That the seriousness of the U-boat warfare is going home to the English people is shown by the stormy discussions in

Parliament over that question, especially so in the speeches of Lloyd George, the foremost English statesman. The U-boat is the most terrible and most effective implement of war that has ever been conceived.

One must always ask for what are our enemies waiting? Why have they not accepted the offers of peace that have been proffered to them so many times? Do they still think that they will be able to ruin us on land? I would think that after the magnificent successes of our army on the western front that this thought would have departed sometime ago. Do they still hope for our economic breakdown? This hope must be doubtful, for the door to the East is now opened. No, their main hope is for our defeat through internal disorganization; that the German people will give way because of the privations that they have endured during the last year and in a moment of thoughtless revolution will force the government to make peace. This is unheard of both in this country or in other countries. That the English working classes desire the defeat of Germany is an assured fact; and they will work hand in hand with the Government with this end in view. If our factories should cease work and our brave men at the front should suddenly find themselves without munitions and other war material our country would soon be overrun by the enemy. Not one of our enemies, under those conditions, would recognize any desire on our part for peace. By this I mean to bring home the fact that any father who has entertained the thought of a general strike should feel ashamed of himself when he thinks of his son fighting in the front lines.

One point concerning the U-boat warfare is especially significant, and that is if England retires from this war economically strong and great she will after the official conclusion of the war continue her economical war against our nation even to the last piece of bread and the last coffee bean. If we had not conceived the U-boat warfare and thus threatened England's economic resistance the privations and sufferings of this war would not have been overcome for a period of 10 years.

The condition of our armies at the front is well known to you all. I have just explained how the downfall of England on the sea is desired by us all. Our military situation is better than ever before. To make the best out of what has gone before it will be necessary for the people at home to hold out and believe with us that a general victory is in sight. No words are more significant concerning the victor of this war than those words of Clemenceau—that the one to win the war will be he who believes in victory for the longer quarter of an hour. I shall therefore finish my paper with the cry—

Believe, hold out, and conquer.

U. B. 110.

Source: Reliable.

(11895.)

4 September, 1920.

Description of Ventilating System.

Two motor-driven fans are fitted in the engine room between frames 24 and 26, one on port side and one on starboard. They are made by Turbon Company, Berlin, and supply or exhaust 1,700 cubic meters of air per minute, at an absolute pressure of 240 mm. of water.

Motors.

Direct current, shunt wound, reversing poles, and auxiliary compound winding.

Horsepower, 2.7–4.6 at 110–170 volts and 3,000–3,880 revolutions per minute. Consumption, 24–26 amperes.

Ventilating Pipes.

Two separate pipe systems run the entire length of the boat under the top of the pressure hull. The starboard system is for supply and the port system for exhaust.

The supply system is fitted with the necessary valves in each compartment, the air entering the compartments at the top. The branch pipes of the exhaust system open just above the flats and are fitted with sluice valves or flaps.

Water-tight valves are fitted to the main supply and exhaust pipes where they pass through bulkheads 10, 26, 33, 40, and 47. These valves can be worked from either side of the bulkheads and are so arranged that a clockwise movement shuts and a counterclockwise movement opens them. Drain cocks are fitted to the lowest points of the ventilating pipes, and gauges for measuring air pressure and speed are fitted to the pipes.

Supply and Exhaust Trunks for Ship Ventilation.

A supply valve for admitting fresh air and air-exhaust valve for carrying off foul air are fitted in the pressure hull between frames 24 and 25. These valves are operated from the engine room. A pressure-tight trunk runs from each of these valves to the upper part of the fairwater abaft the conning tower. A head valve is fitted to the top of each trunk, operated from the auxiliary engine room between frames 33 and 33a. These head valves are partitioned off in recesses so that foul air from the exhaust trunk can not enter the supply trunk. The conning tower fairwater is pierced with a sufficient number of holes on each side to provide a free passage of air to and from the trunks.

A water collection trunk is connected to the foot valve of each of the above trunks. Drainage is effected through a 100-mm. drain

pipe led to the bilges. The bends of these drain pipes are always kept full of water. A 25-mm. drain pipe is led from the operating spindle of each of the head valves.

Diesel Supply.

The Diesels are supplied with air independently of the ship ventilation through a pressure-tight trunk in the after fairwater of the conning tower. A foot valve operated from the engine room is fitted in the pressure hull between frames 17 and 18. The trunks running inboard from this valve are provided with openings through which air enters the engine room. The trunks are extended to form water collectors, and are drained by a 60-mm. pipe led to the bilges. A head valve is fitted at the top of the main supply trunk, operated from the after crew space between frames 32 and 33. The fairwater of the conning tower is pierced with holes on starboard and port sides to provide free passage of air to the trunk. Twenty-five millimeter drain cocks a and b are fitted on the foot valve and operating spindle of the head valve.

INSTRUCTIONS FOR OPERATING.

(a) On Surface with Hatches Closed. Port Fan Sucking (Starboard Fan Not Working).

(1) Open head valves of supply and exhaust trunks.

(2) Open foot valves of supply and exhaust trunks.

(3) Open drain cocks on operating spindles of head valves.

(4) Fill the bends of drains from water collectors with water.

(5) Adjust rotary slide valves.

(6) Supply and exhaust valves in the different compartments opened as required.

(7) Close valves and flaps in battery supply and exhaust leads.

Port fan sucks foul air from the compartments through the exhaust leads and forces it into the open air through the main exhaust trunk. Fresh air flows into the main supply trunk owing to the vacuum created by the exhaust fan and is led through the supply system to the various compartments.

(b) Port Fan Sucking. Starboard Fan Delivering Air.

Port fan sucks foul air from the compartments and forces it through the main exhaust trunk into the open air.

Starboard fan sucks in fresh air through the main supply trunk and forces it into the supply system.

(c) Port Fan Sucking. Hatches Open.

As (*a*), but air is now supplied through the open hatches.

(d) Starboard Fan Sucking. Hatches Open.

Should port fan break down, starboard fan may be used to exhaust foul air. Foot valve of supply trunk should be closed. The foul

air is then drawn under the closed foot valve to the starboard fan through the cross connection between fans. In this case, fresh air can be supplied through the hatches *only*.

Submerged.

(1) Close head valves in supply and exhaust trunks.

(2) Close foot valves in supply and exhaust trunks.

(3) Close drain cocks c and d on operating spindles of head valves.

(4) Close foot and head valves on Diesel supply.

(5) Close drain cocks a and b on foot valve and spindle of head valve.

(6) Close flaps and valves in battery supply and exhaust leads.

Port fan sucks air through the exhaust system, and forces it through the cross connection into the supply leads, through which it is led to the compartments as in surface running. (See Sketch III for connections.)

In emergency, the starboard fan may be used.

These ventilating arrangements are intended to produce ample circulation of air when running submerged, and to maintain the greatest possible equality of temperature throughout the boat.

An air-purifying battery with five regenerators is fitted forward and aft. The air may be led through these as required. (See B. No. 19.)

140 regenerators in all are distributed as uniformly as possible in the various compartments.

In addition, 8 oxygen bottles are provided, 5 forward and 3 aft. The capacity of each bottle is 50 liters. The oxygen is supplied through 4 distributors, one in stern torpedo room, one in control room, one in conning tower, and one in the bow torpedo room. The distributer in the control room can supply oxygen direct into the supply leads.

DURING CHARGING.

(a) With Port Fan and Hatches Closed.

The exhaust pipes from each cell are joined to a common pipe 80 mm. internal diameter, one on either side of the boat running fore and aft. These pipes are connected to the ship exhaust system, through valves which can be closed.

During charge the fan draws off the gas from the cells and delivers it into the open air through the main exhaust trunk. All the valves and flaps in the branches from the ship exhaust lead should be closed. On the other hand, the four valves on the exhaust lead and the four flaps on the supply lead for battery ventilation should be *opened*.

It should be noted that the angle valves on bulkheads 26 and 47, port side, are used both for exhaust from inside boat and for exhaust

from the battery. The valve seat for ship exhaust should be *closed*, and the valve for battery exhaust *opened*.

A stop valve F in the delivery leads to fans prevents battery gas penetrating into the boat.

The necessary fresh air passes through the main supply trunk to the supply system and thence through the branch supply pipe to the forward and after battery spaces.

(b) With Starboard Fan and Hatches Open.

In the event of a breakdown of the port fan the battery can *only* be charged with hatches and bulkhead doors open. (For necessary adjustments see sketch IV.)

Special Care Should Be Taken to Continue to Run the Fan for Some Time After Charging Is Comp'ete, to Prevent any Accumulation of Explosive Gases.

In order to protect the cells against the inflow of water with the air a water trap is fitted in each exhaust pipe above the battery covers. *The bends in the drain pipes are always to be kept full of water.*

The supply lead is broken just above the battery covers, so that any water which may penetrate can be caught in a drip tray.

BRITISH "M" CLASS SUBMARINES—12-INCH GUN MOUNTING, ETC.

Source: Reliable.

(12046.)

2 September, 1920.

The magazine is at fore side of shell room and is 10 feet long, the shell room being 9 feet in length. The pump room (below) and handling room (above) are abaft the shell room and occupy a space of length 12¼ feet. The pump room is below and is 5 feet 4 inches in depth, the floor forming top of hydraulic tank, which is 3 feet 10 inches above keel plate at middle line.

The pump room contains the hydraulic pump from which the hydraulic pressure is obtained for working the gun systems, i. e., loading, training and elevating, and running in and out. The pump is driven by one of two motors of 150 horsepower, one motor being a stand-by. Either can be clutched in or out with the driving shaft of pump. A hydraulic accumulator about 6½ feet long and 15 inches diameter is fitted for storage of hydraulic pressure and this is connected at the top with a number of air bottles. Automatic arrangements are fitted so that as soon as the accumulator is fully charged the pump motor is cut off.

Extending from the floor of pump room (i. e., the inner bottom) to the loading tower is a water-tight trunk 17 inches wide and 7

feet long, in which moves a shell and ammunition hoist which is raised or lowered by a telescopic hydraulic press. This hoist has its center on starboard side, 15½ inches from the middle line of boat, and is fitted with a hinged water-tight scuttle where it passes through the pressure hull. The gearing for operating this scuttle is interlocked with the cage of the hoist, so that it is impossible to close it while the cage is being worked, or to operate the cage while the hatch is closed.

The cage is a double-storied one, taking the ammunition in the upper story and the shell in the lower. Rails are fitted on port side from magazine to the hoist and from shell room to hoist on starboard side.

Ammunition is raised onto a carrier on the port-side rail by a hand winch and is carried back on rails to the hoist, is then deposited on a tray at port side of hoist and falls into the upper story of cage. The carrier on the rails is operated by a hand winch.

Shell is raised from its storage in the shell room by a hydraulic lifting press and is traversed in a grab on the rails from the shell room to the hoist by a second hydraulic press. It is then lowered into a tray on the starboard side of hoist, and by a system of hand levers is tipped into the second or lower story of the cage.

The cage is then hoisted to the loading chamber. The shell is deposited from the cage sideways on to a guide or tray at the middle line in the loading chamber, so arranged that the center of charge is directly opposite the bore of gun when the latter is at maximum depression (2°).

The loading tower is a pressure-tight domeshaped space with a scuttle opening outward opposite the bore of gun when the latter is at 2° depression and at middle line. Crown of tower is 15 feet above low-water level and axis of gun 10½ feet.

The breach of the gun, when run back, is about 3 feet forward of the fore side of the loading tower, and to span this distance a loading tray is pushed out by hydraulic power through the scuttle and forms a continuation of the loading tray, on which the charge or shell rests when deposited from the cage.

The charge and shell are pushed home by a chain rammer worked hydraulically, the cage being allowed to descend the right amount to deposit the charge on the loading tray after the shell has been rammed home.

Abaft the loading tower is a director tower containing a periscope which can be raised or lowered and at which the gunnery officer observes the direction of the target, etc., and transmits the necessary training to a gun layer whose position is in the crew space on the

fore side of magazine. From this position the training and elevation can be controlled. Indicators are fitted at this position and also in the director tower worked direct from the gun or carriage.

The fore side of loading chamber is fitted on starboard side with a second water-tight scuttle through which the breechblock can be opened or closed.

The gun and mounting revolve about a center 18 inches abaft the fore bulkhead of magazine. The weight is taken on rollers and roller path 7½ feet diameter. The trail of the carriage is also supported on a partial roller path 18¼ feet above axis of revolution.

Training is effected by two hydraulic presses fitted transversely at a distance of 9 feet 11 inches from the axis of revolution and connected one portion to the pressure hull and the other portion to the under side of carriage.

Elevation (maximum 20°) and depression (2°) is carried out by a hydraulic press with cylinder 14 inches diameter under the gun and between the side girders of carriage. The end of the piston rod is connected to a crank arm formed of a casting bolted to the jacket carrying the gun. This press is fitted on fore side of axis of revolution.

Muzzle of gun is closed and made water-tight by tompion worked by hydraulic means from director tower. The pipes are led aft from muzzle down central tube of mounting inboard and thence to director tower.

SUBMARINE SCHOOL AT KURE.

Source: Reliable.

(11969.)

19 August, 1920.

In accordance with the recent budget, a submarine school will be immediately established at the Kure Naval Yard, which will be the first of its kind in Japan. The head of the school will be Capt. T. Idzumi. This officer was sent in command to Malta some time ago to receive the surrendered German submarines, and is considered the leading authority in the Japanese Navy on submarines.

FIRE IN SUBMARINE INJURES NAVAL MEN.

Source. Reliable.

(7359.)

22 September, 1920.

On September 1 an oil fire occurred on board a new submarine being fitted for sea at Mitsubishi works in Kobe. The fire was quickly extinguished.

There were 150 workmen on board, and 48 of these and 3 officers were injured. Five of the workmen are in a serious condition.

The extent of damage to the submarine is not definitely known, but it is believed to be slight.

SUBMARINE NO. 35.

Source: Reliable.

(6452–A.)

22 September, 1920.

Submarine *No. 35*, submerged displacement 1,000 tons, which was built at Kure, successfully completed her trials and was turned over to the Navy on 18th of August, 1920.

MISCELLANEOUS.

VISIT TO YOKOSUKA NAVAL STATION, SEPT. 14, 1920.

Source: Reliable.

(5472.)

22 September, 1920.

The large building ways are empty and no preparation is being made to lay down ships on them. The adjoining small building ways now contain two submarines of about 800 tons submerged displacement; they are about 30 per cent completed. The smaller ways can be used for one cruiser, two destroyers or two submarines. The *Mutsu* is alongside a dock and is filled with workmen. The above water armor is being secured. The water-line belt seems to run from stem to stern. The above water armor extends to the main deck and to within about 30 feet of the bow and stern. It is being backed by planking from 1 to 1½ inches thick, and the armor on the dock alongside was 10 to 12 inches thick. The *Mutsu* is expected to be completed by the summer of 1921.

The yard is filled with piles of steel plates from 1½ inches thick down, and there are also many piles of pig iron. There is very little lumber.

There are about 12,000 employees in the yard, including about 500 women and excluding apprentice boys.

Machine Shop.

Many new light machines have recently been installed in the machine shop. It is estimated that at least 30 per cent of the small lathe drills, etc., have been installed within the past month or two. The concrete foundations for these machines are new and have not yet been discolored by oil. The new machines seem to have been located wherever there was room to place them, with little regard to types and systems. As a result the machine shop is congested and workmen are crowded together. However, it does not appear to have impaired their efficiency, and generally speaking they seem to be more industrious and painstaking than our navy-yard workmen. Many finished products were inspected and the workmanship was found to be excellent. The machine-shop floors were piled so high with unfinished work, of all kinds, that it was extremely diffi-

cult to walk about. The following is a list of the more important work being done in the machine shop:

Construction of four Diesel engines for submarines; work almost completed. The constructor in charge said that the construction of these engines gave him more trouble than any other work he had. He did not know whether they were designed for spray or solid fuel injection, but thought spray injection was used by Japanese submarines. Machining submarine vertical rudder castings. There were 15 of these piled up in the shop and 4 or 5 completed ones outside.

Machining propellers for submarines, destroyers, cruisers, and battleships. There were many propellers of all types about the shop. A careful inspection of many did not reveal a single flaw in any casting, and showed that the machining was excellently done. The blade tips are slightly heavier and not as sharp as ours.

Construction of small triangular-shaped condensers. These must be either for destroyers or light cruisers. There were four or five assembled except tubing and about 20 additional tube sheets already drilled piled on the floor. The condensers are a straight tube type, with ferrule ends. Practically all the auxiliary machinery for the *Mutsu* is under construction. Her turbines are being built in a separate shop through which I was not shown. I did, however, see much of the blading. This seems to be for a Brown-Curtiss turbine. The blading is being finished by boys not over 10, or at the most 12, years of age. Each blade is gauged by an inspector. The work is excellent and uniform.

One section of the shop is used for hydroplane engine construction; about 30 engines were being built here. They are a vertical 6-cylinder type. The constructor informed me that the engine was not fast, but very reliable. When asked the name he stated it was Japanese Navy type, No. II. However, it was identical with the engine installed in a French hydroplane that I saw some time later. About one-third of the employees working on these engines were women.

Boiler Shop.

I was not shown through the boiler shop, but as I passed outside of the shop I could see no work being done except construction of Japanese Navy type boilers, apparently for the *Mutsu*, as Yarrow and Thornycroft boilers are used almost exclusively in their destroyers. The Navy type boiler is, so far as I know, of quite an original design. It is about the width of small tube boilers used in destroyers, but somewhat higher. There are three firing doors and seven circular drums, all about 2 feet in diameter; four drums are in front row, three in rear row. The top drum is for steam, the

other six being water drums. The drums in each row are placed directly over each other and about 1 foot apart, connected with each other by about twenty 4-inch straight round tubes. The front and rear drums are connected with each other by staggered sets of about 2½-inch curved tubes, each set containing eight tubes curved both ways from the center, making an ellipse. The heads of the drums are riveted, not welded, and both heads are concave, not convex, as in our drums.

Foundry.

There was nothing of particular interest to be seen in the foundry. Every available inch of floor space was in use, and the constructor said it was entirely too small, which was self-evident. About half of the employees were either women or boys 15 years of age and under.

Ordnance Factories.

The ordnance manufacturing plant is a complete unit across the bay from the navy yard and entirely independent of it. This plant has its own pattern shop, foundry, machine shop, etc. The principal work here is as noted below:

14-inch shells: There were about 200 of these in one pile; the soft cap is about 8 inches long, with a rounded nose. Submerged torpedo tubes: There were about 15 completed 18-inch loading submarine torpedo tubes outside the shop and several being worked on in the shop; work was also being done on four or five side-loading 21-inch tubes for battleships; no above-water tubes were seen; all tubes were single. Torpedo after bodies and air flasks: There are a few after bodies being machined; there was one pile of about 20 completed 18-inch air flasks in the shop and four or five being machined; there were about ten 21-inch air flasks in various stages of completion; outside the shop there was a pile of at least 40 air flasks; no work done on these; they were equally divided between 18 and 21 inch types; no air flasks are made here, most of them being purchased either in England or Sweden. I saw no work done on torpedo engines, fuel flashes, etc.

Guns.—The turrets, barbettes, and carriages for *Mutsu's* 16-inch guns were being constructed here. There was also a nearly completed 5-inch gun in the shop. The elevating is done entirely by foot pedals, connected by chain drive to the elevating gear. There is no gear shift to change speed of elevating. The elevating pointer is mounted on a bicycle seat directly over the pedals. I was informed that elevating of all secondary battery guns is done exclusively by this method. Training is by hand. A ballistic dial is connected with the range dial in such a way that by applying the ballistic correction the point of reference on the range dial is shifted

the proper number of yards. Deflection is set on a dial, not on a drum, that is marked from zero to 40, right and left.

Paravanes.—There were two explosive paravanes outside the shop. These had just been received from Vickers and are to be used for experimental purposes.

Mines.—There were no mines being constructed. The Japanese have made little or no progress along this line since the war with Russia, and their present mine is obsolete. I was informed by one officer that they expected to receive very soon two mines from Germany and after experimenting with these and making some minor changes they will proceed with the manufacture of them under the name of the Japanese Navy type. All the officers seem convinced that the British, French, and American mines are quite inferior to the German mine. I was told that many of the new destroyers are being fitted either as mine layers or mine sweepers.

Hydroplanes.—There were four small hydroplanes under construction. They are to be used for instruction purposes. These planes are called Japanese Navy type, but so far as I could see are exact reproductions, even to the color of painting, of a French plane after which they are being modeled. The engine is the six-cylinder vertical type referred to above.

Electrical gear.—There was some electrical gear being manufactured, but this branch is small and of little importance. The constructor stated that the machine work in this branch is satisfactory, but that handwork is of a very inferior and unsatisfactory nature.

There were no searchlights being made here, but there are numerous new 110 c. m. searchlights installed at various points around the harbor.

Gunnery and Torpedo Schools.

There are three courses—namely: Common course, higher course, and special course. The common course in both torpedoes and guns is compulsory for all officers, while in the grades of either ensign or sublieutenant, and the common course in either one of these branches is compulsory for practically all enlisted men of the deck force. The higher and special courses are voluntary and by selection for both officers and men. The common course in gunnery comprises small-arms practice, pointing and loading drills with all sizes of guns, including antiaircraft, bayonet practice, fencing drills, assembling and disassembling guns, fire-control drills, and for officers, spotting.

A 12-inch turret containing one gun is installed. One side of this gun is cut away similar to a loading machine. Beneath this turret

is a handling room and magazine, so that the drill is an actual reproduction of practice on board ship.

Another point of interest was the antiaircraft training. There are four 3-inch antiaircraft guns installed in an open space; above them at various heights and angles are eight systems of wires; small airplane models, with about 10-inch wing spread, are attached to these wires and rigged so that they can be run along over the guns. Kite balloons are also used in ex-caliber antiaircraft practice.

The common course in torpedoes consists principally in breaking down, assembling, and firing torpedoes, and testing and adjusting gyroscopes. Very little work is done with mines.

The electrical school is housed in the building with the torpedo school, but is an entirely separate course of instruction. The Navy Department intends separating these schools as soon as a suitable location for the latter can be found, when it will be placed under the Department of Naval Communications. The electrical school, like the others, has three courses—common, higher, and special. The school is used primarily for developing radio operators. In the common course only sending and receiving are taught.

Officers and radio operators of Japanese merchant vessels must belong to the Naval Reserve Force (I do not know about the other personnel of merchant vessels). When a man qualifies as a merchant officer he is sent to the gunnery school, where he is given a special six months' course in gunnery and other subjects pertaining to the Navy. Before a man can qualify as a merchant ship radio operator he must take a six months' special course at the electrical school. There are about 70 such persons in the school at the present time.

General.

Oil tanks.—There were no oil tanks visible and no oil barges in the harbor. One new fuel ship, the *Noma*, was moored in the harbor. She is to proceed in the near future to San Francisco for a cargo of oil.

Coal.—There was a small pile of coal in briquettes, but not sufficient to last longer than about two months.

Magazines.—There is a narrow canal connecting the navy-yard harbor with the torpedo-school harbor. Just abreast the entrance to this canal, on the starboard hand, when proceeding from the navy yard to the torpedo school, there are three heavy iron doors set in the base of a precipitous rocky hill. This hill has undoubtedly been tunneled and most likely is used for the stowage of ammunition.

German submarines.—There are two German submarines moored alongside a small unused dock. From a distance it could be plainly seen that the hulls were in bad condition.

Expansion.—The question of expanding this yard, as well as all other Japanese navy yards, is a serious and difficult one. This is due to the fact that the yards are completely surrounded by high hills. At this yard many hills have, during past years, been cut away. Three hills have already been tunneled here, but there is hardly an available foot of ground left for building purposes.

Labor.—The yard workmen all appeared to be cheerful and contented and were very respectful toward the foremen and officers, both in the shops and outside the yard after the close of working hours. I did not see a single person in torn, dirty, or ragged clothing during the entire day.

On discussing the labor question the Chief Naval Constructor stated that there was much grumbling and dissatisfaction when the yard workmen were first required to work continuously during working hours, but that now the order is accepted and the grumbling has subsided. He stated, however, that it is only a question of time until labor in Japan must be reckoned with. (I believe him to be unnecessarily pessimistic, for certainly the conditions here are almost infinitely better than at home.)

Discipline and cleanliness.—The one thing that struck me most forcibly was cleanliness. There was not a piece of scrap metal, a stray bolt, a stick, a line, or a fag end of anything to be been lying about, either in the yard or the shops. Every place was immaculate and sanitary. Workmen and enlisted men alike were in neat clean clothes. When it is remembered that there is not a sidewalk or a paved street in the yard, and that the roads are muddy fully 50 per cent of the time, to accomplish these results seems almost impossible. Discipline appeared to be very good. At the gunnery and torpedo schools it resembled somewhat the discipline of our training stations, rather than that afloat. There is however, a bit of swagger about it. When the classes were being marched back from torpedo instruction I stood in a sheltered spot to watch them pass. The commander of the last company saw me, whereupon he immediately gave an order to his company which resulted in its swinging into a goose step. This I am convinced was simply for show.

Courtesies among officers, whether or not of the same rank, are punctiliously observed.

THE LOST HAVERSACK.

Source: "The Secret Corps," by Capt. Ferdinand Tuohy.

[The following is one of the incidents described in the above-mentioned book. It is an example of what may be accomplished by false information and is quoted here as of possible interest to the Naval Service.]

"One afternoon toward the close of October, 1917, a staff officer attached to general headquarters in the field, Egyptian Expedition-

ary Force, rode out into No Man's Land in the direction of Beersheba.

"The distance between the Turk and ourselves at this desert end of the line was sometimes as great as 8 miles, and frequent mounted reconnaissance patrols were necessary—the more so at this particular juncture in that Allenby's push for Jerusalem was due to start from day to day.

"Followed by an orderly, the staff officer rode about for some time, now consulting his leather-incased map, now scanning with field glasses the unending camel scrub and sand. Suddenly zip-zip-zip—several rifle shots rang out, and the officer half fell from his horse, then, recovering, headed about. The couple had apparently ridden right on to a Turkish outpost, and the orderly needed no second word of command as to the direction in which he was now to proceed.

"Before following him, however, the staff officer swung around two or three times in an effort to recover his haversack, which had fallen to the ground as he had tilted over when hit. But the Turkish fire was becoming more rapid, and he apparently was getting weaker—finally the haversack had to be left there on the sand under the noses of the Turks.

"In the course of the evening a G. R. O. something in this style was circulated throughout the three corps in the line:

"'Urgent.—While on reconnaissance patrol in No Man's Land this afternoon, about x 21 d 4. 3, a staff officer lost a haversack. If found, the haversack is to be returned forthwith to general headquarters without being opened or its contents examined in any way.'

"Later an enciphered wireless message added: 'Determined efforts are to be made to-night by troops in the sector involved to recover the lost haversack mentioned in G. R. O. No. 102.'

"That night the writer messed at 20th Corps headquarters and was greeted somewhat after this fashion: 'Oh Lord, Here's one of these G. H. Q. wallahs. Nice business this afternoon. Can't go out on patrol without giving the whole show away to the Turks. Found your blessed haversack yet—I should say not—not likely to either. The old Turk's fairly gloating over it by now—contained the whole plan of the push, I suppose? The fellow who dropped it ought to be strung up. Prancing about up to the Turk with operation orders in his pocket.

"And so on.

"While the tone was primarily one of raillery, there was nevertheless a distinct undercurrent of something not at all so pleasant. After all, this sort of thing, the staff giving the whole show away, and sacrificing hundreds of lives, was hardly calculated to improve

the discipline, morale, or the fighting efficiency of any force in the field.

"That night, at corps headquarters, out in the sandy wastes of the Gaza, it was hard work keeping one's mouth shut; sitting still hour after hour, hearing bursts of condemnation and abuse, when one word would have turned that very condemnation and abuse into unbounded admiration.

"For here is the true tale of the haversack dropped about x 21 d 4. 3, Palestine, on the afternoon of 25 October, 1917.

"On the Gaza front at this period the British line extended from the coast to the vicinity of Beersheba—60 or 70 miles inland toward the desert. In the push for Jerusalem, Gen. Allenby's principal plan hinged mainly, if not entirely, on the swift and sure reduction of Beersheba. Unless this was effected the whole action stood in danger of fizzling out.

"Well, the Turks got wind of Gen. Allenby's plan, and shortly before "Z" day—the day of our offensive—they moved a division from Gaza across into reserve at Beersheba. The move about balanced the opposing forces, numerically, in the vital Beersheba sector, and so it became absolutely necessary to do something to cause the Turks to move this division back to Gaza again, or, for that matter, to any part of the line as long as it was taken away from Beersheba.

"And this, how the thing was done, without any sanguinary local attack, without the loss of a single life—perhaps the strangest tale in all the war.

"The head of the enemy's intelligence service opposite was one Captain Schiller.

"An intelligence service exists to find out what your opponent contemplates doing next.

"It now behooved our intelligence to make their, the enemy, intelligence believe that there was nothing to fear in the Beersheba sector and that the vital attack was coming elsewhere. It behooved us to deceive Schiller and, through him, Kress von Kressentein.

"Scheme after scheme was weighed and found wanting, and the days were slipping by. In the end, it was agreed that the one hope would be to devise means of getting faked documentary evidence through to Schiller himself, and so to set the stage that even that wily customer would be taken in. It would be a risk, for should Schiller decide that the information in question had been purposely conveyed to him, that, in fact, it was dope, we had better far have left the whole affair most severely alone. But now, to bring this queer tale to a conclusion, let us reconstruct the scene in Schiller's office, as we believe it to have been acted that October night follow-

ing the discovery of a British haversack by a Turkish patrol in No Man's Land.

"Schiller opens the haversack and finds inside some sandwiches, an electric torch, and a flask, a map, and a wallet and notebook combined. He reads intently several pages of scribbled pencil notes written in diary form, then pushes back his chair and laughs outright: 'Ha! ha! Das ist gut. Specially doped for us to pick up. They are quite clever, these English.'

"'Pardon, Captain, but the officer who dropped it was wounded and made several attempts to pick it up again.'

"Schiller glances up for a second time, then, shaking his wise young head with a knowing smile, returns to the wallet. He pulls out 20 pounds in notes, looks straight in front of him for a moment, then: 'No, they stuffed these in as part of the game.'

"A signal officer now announces: 'The English have just sent out a wireless message saying that every effort is to be made to-night to recover a haversack that was lost this afternoon in No Man's Land.'

"'What's that,' raps out the German intelligence officer.

"The newcomer repeats the message and places a carbon copy of it on the table. Schiller gets up and waves him away and paces the room.

"'It can't be. It can't be. Don't you realize, Schmidt, that if these notes are genuine all our reckoning has gone wrong, that they are going to attack at Gaza first, not at Beersheba? These notes refer to all of Allenby's conferences for the past month. I'm certain that they are faked. Why, look what these prisoners told us yesterday. And their artillery preparation and wireless activity. And what our observers say. And our agents ——.'

"'There are still some papers in the wallet, sir,' says the younger officer by way of answer.

"'Ist mir egal,' rasps the other fiercely; then, changing tone: 'Gott in himmel, what have we got here?' and he reads: 'Dear M———: Sorry we must delay our little shoot, as I'm running down to Cairo for a few days' rest. Back November 4. Yours, E. Allenby.'

"Schiller looks slowly from the letter to the calendar and from the calendar to the letter.

"The British offensive was expected for October 28, and here was the British commander in chief going away on leave.

"'Donnerwetter,' proclaims the German, 'if this isn't becoming—yes, what is it?' (This to a junior officer just entered.)

"'English prisoners taken at El Tugger say they were warned this afternoon about the loss of a haversack. If anyone found it he was not on any account to open it, but was to send it direct to headquarters.'

"Schiller doesn't answer, as this further evidence of authenticity teems in.

"Eagerly, almost feverishly, he returns to the wallet and takes out its remaining contents—a photograph of a woman, written across in endearing terms, and a letter.

"Schiller reads the letter avidly, on and on. It tells of the birth of a firstborn, of little hands and little feet—it rambles on in that tender language which only a young mother can make her own. The letter is crinkled and has been clearly read and reread a hundred times—it is a letter in a million. Its loss could only be accidental.

"So reasons Schiller.

"The division that had been hastily moved into reserve at Beersheba was as hastily moved back to Gaza.

"On 28 October we attacked the weakened Turkish position at Beersheba, and, as all the world knows, carried all before us.

"And the letter concerning the firstborn, the letter that saved hundreds, possibly thousands, of British lives and went far to giving us Jerusalem and ultimately a whole country.

"Has the little hospital nurse at El Arish, with the girlish handwriting, forgotten all about it?"

NOTES ON THE JAPANESE NAVY.

Source: Japanese Naval Officer.

(3310.)

22 September, 1920.

Camouflage during the World War—comparitively simple, and practically confined to vessels serving in war zone.

Japanese naval guns.—Wire wound, following the British practice.

No Lewis or Browning guns in Japanese Navy.

Fuses.—Two kinds, detonator and time.

Primers.—Two kinds, percussion and electric. Percussion for use in small calibers.

Cartridge cases.—Up to and including 6-inch.

Powder charges.—In silk bags about 6-inch.

Depth charges.—Furnished Japanese men of war by British. Some manufactured in Japan after war. Slightly modified British pattern.

Large caliber projectiles.—Head lengthened since the war.

Target practice.—It is claimed that balloons and airplanes were used in gun practice just completed at Saegi Bay, 15th July—15th August, 1920. It seems certain, however, that the use was very limited. It is also stated that fire-control officers and spotters were

stationed in tops, and on conning tower, as well as spotters in balloons and airplanes. Camera observations are claimed to have been made from the towing vessels. No pictures of salvos and target were claimed to have been taken from airplanes or balloons. New gun pointers were formerly given a practice at 1,600 meters at an anchored target. But this short-range practice has fallen into disuse of late years, and is seldom held. They apparently have a practice at about 7,500 meters, and a long-range practice at about 20,000 meters.

This latest practice at Saegi Bay was held at about 20,000 meters.

The target was towed on variable courses (not on steady course), given commanding officer of towing ship in a sealed envelope, opened when practice begins.

The target was much smaller than our long-range targets, 120 by 30 feet. The Japanese Navy has discarded this sized target and raft as being impracticable for towing at high speeds.

The firing vessel steams various courses, prescribed in a sealed envelope handed by C. U. to commanding officer.

They have individual, divisional, and squadron practices, similar to United States Navy procedure.

Torpedo tubes.—As yet the Japanese have manufactured no triple torpedo tube, only double.

CHARACTERISTICS OF THE GERMAN LONG-RANGE GUN.

Source: Reliable.

9 October, 1920.

The German long-range guns used in bombarding Paris were constructed from worn-out 15-inch, 45-caliber naval guns, mounted on concrete emplacements. The converted guns were of two parts; the main section was 98.5 feet long and the forward section 19.7 feet.

The 15-inch gun was bored out and a heavy uniformly-rifled tube 8.26 inches in diameter inserted, 43.5 feet of this tube projecting beyond the muzzle of the gun. Over this projecting portion a hoop was shrunk. The muzzle section, 23.6 feet in length, was screwed to the end of this hoop tube. This forward tube was unrifled and was probably added to impart additional linear velocity and better align the axis of the projectile with that of the bore of the gun. The reliners used in this gun were of such a thickness that when worn out they could be rebored to 9.3 inches, and then to 9.93 inches. Up to the time the firing on Paris ceased at least one of the seven guns constructed had been rebored and was firing 9.3 inch projectiles.

A comparison of the general characteristics of this gun with our 14-inch naval gun, Model 1920, follows:

Source of information: Ordnance Department.

Comparison of German long-range gun and American 14-inch Navy gun.

	German 8.26-inch.	American 14-inch Navy.
Muzzle energy.....foot-tons..	467,250	85,750
Range.....yards..	132,000	39,000
Length.....feet..	118.2	59.7
Weight.....pounds..	318,000	180,395
Muzzle velocity.....feet per second..	4,760	2,800
Elevation (maximum).....degrees..	55	38
Chamber pressure.....pounds per square inch..	44,000	40,000
Length of projectile.....feet..	3.44	5.09
Accuracy life.....rounds..	50	250
Weight of projectile.....pounds..	264	1,400

WIRELESS STATIONS TO BE INSTALLED IN MEXICO.

Source: Reliable.

(13573.)

18 September, 1920.

The Secretary of Communications and Public Works has approved the plans of the Director of Telegraphs for the installation of radio stations of three classes at different points in Mexico, as follows:

(1) Capable of communicating with Mexico City, equipped with apparatus of 10 kilowatts.

(2) Apparatus of 4 and 5 kilowatts.

(3) Apparatus of 1.5 and 2 kilowatts.

Stations of the first class will be at principal centers of communication, receiving messages from stations of lower power for transmission to more distant points. These will be situated at Chihuahua, Saltillo, Torreon, Hermosillo, Mazatlan, Vera Cruz, San Cristobal, Las Cacas, and Merida.

Stations of the second class will cover the ports and capitals of the States, with ability to communicate with one or two stations of the first class. Stations of the second class will be at Ensenada, La Paz, Nogales, Alamos, Ciudad Juarez, Piedras Negras, Isle Maria, Madre, Tepic, Acapulco, Salina Cruz, Oaxaca, Durango, Zacatecas, San Luis Potosi, Nuevo Laredo, Matamoros, Ciudad Victoria, Tampico, Puerto Lobos, Tuxpan, Puerto Mexico, Guadalajara, Villaherrosa, Campeche, and Payo Obispo.

Stations of the third class will cover the other State capitals and ports, as follows: Mexicali, Santa Rosalia, San Jose, San Jose del Cabo, Guaymas, Culiacan, San Blas, Colima, Chilpancingo, Monterrey, Aguascalientes, Guanajuato, Queretaro, Morelia, Pachuca, Toluca, Cuernavaca, Tlaxcala, Puebla, Jalaps, Ciudad del Carmen, Progreso, Puerto Morelos, Xcalak.

At the present time there are installed 24 wireless stations, not counting Chapultepec, and the receiving stations at Ixtapalapa and Guaymas, four of which are of 10-kilowatt power.

The wireless stations of these three classes will cost the Government $203,000 (United States currency).

EXPENDITURE OF ARTILLERY AMMUNITION DURING THE ST. MIHIEL OFFENSIVE.

Source: War Department.

25 September, 1920.

During the five days of fighting at St. Mihiel, September 12 to 16, 1917, the artillery expended approximately 700,000 rounds of ammunition. Of this, 500,000 rounds, or 71 per cent, were fired by the 75-mm. guns and 83,000 rounds, or 12 per cent, were fired by the 155-mm. howitzers. The offensive was started with 1,801 pieces of field artillery and 515 pieces of heavy artillery. The daily expenditure of ammunition in each case is based on the assumption that the artillery beginning the offensive continued to fire throughout the five days.

Comparison of expenditure of heavy and field artillery ammunition.

	Number of rounds fired.		
	Field.	Heavy.	Total.
Sept. 12	498,860	56,770	555,630
13	73,649	4,693	78,342
14	20,907	6,459	27,366
15	17,411	2,188	19,599
16	12,295	380	12,675
Total	623,122	70,490	693,612

FIELD ARTILLERY.	Rounds per gun.
Sept. 12	277
Sept. 13	41
Sept. 14	12
Sept. 15	10
Sept. 16	7

HEAVY ARTILLERY.	Rounds per gun.
Sept. 12	110
Sept. 13	9
Sept. 14	13
Sept. 15	4
Sept. 16	1

GUNSHOT WOUNDS IN VARIOUS WARS, BY LOCATION.

Source: Reliable.

9 October, 1920.

A study of the location of the 612,245 available cases of gunshot wounds of certain wars classified below shows that 69 per cent occurred in the upper and lower extremities and 31 per cent in the

head and trunk. The highest per cent of wounds in the upper extremity occurred in the Civil War and the highest per cent of wounds in the lower extremity occurred in the World War. The highest per cent of head wounds occurred in the Crimean War and the highest per cent of trunk wounds in the Franco-Prussian War. The following tables show gunshot wounds in various wars, classified by region.

Source of information: The Medical and Surgical History of the Civil War, the Surgeon General, and various foreign statistics.

War.	Head, face, and neck.	Trunk.	Upper extremity.	Lower extremity.	Total.
Civil	26,400	45,184	87,793	86,413	245,790
World	22,241	24,008	54,319	68,158	168,726
Franco-Prussian	17,867	29,850	38,557	42,995	129,269
Crimean	7,263	6,437	11,327	10,937	35,964
Campaign, Italy, 1859	3,564	6,015	11,425	11,492	32,496
Total	77,335	111,335	203,421	219,995	612,245

JAPANESE POLICY—BOLSHEVIST ACCOUNT.

Source: Translation of Message from Moscow Intercepted by Admiralty Wireless.

(11399.)

5 September, 1920.

Vilenski writes as follows in the Izvestiya with regard to the desires of Polish imperialism: "Japan is now a member of the world councils of the great powers and is not content with her rôle of self-defense. 'Asia for the Asiatics' is at present the chief watchword of Japanese imperialism. No effort is being spared to carry out this watchword. Munitions are being manufactured and ships built with feverish haste. Money is being spent on bribing generals, atamans, officers, the press, and anyone who is willing to work for Japan. Japan desires to establish herself firmly on the Continent of Asia. She intends to annex Shantung, Kwangtung, and Southern Manchuria and to extend the defensive coast line in a northerly direction, i. e., to incorporate the maritime province of the Russian Far East in Kwangtung, and thus to establish a neutral zone and to protect herself as an insular State. Japan is striving to attain the disarmament of the entire coast of the Pacific, hoping to protect herself from the danger of Soviet Russia; she is also trying to disarm her victim—China (?). So far, Japan was not faced with serious obstacles in her policy; however, the recent events in China have led to considerable difficulties. The working masses of the entire Far East are beginning to revolt against the designs of Japanese Imperialists. Rebel Korea, China, which is on the verge of a new revolution, and the Russian population of the Far East are all united by their hatred

for Japanese oppression. The working masses of the Far East are forming a united army, which is already carrying on a defensive campaign under the watchword: 'Destruction of Japanese imperialism.' Japanese imperialists have sown hatred in the Far East and now they will have to reap a storm of revolutions which will lead them to their peril."

PROGRESS OF COMMERCIAL TRAFFIC THROUGH THE CANAL.

Source: Reliable.

29 September, 1920.

The total number of commercial vessels which passed through the canal to July 1, 1920, was 10,212. Figures by six-month periods are presented in this table:

Commercial vessels passing through the Panama Canal.

Period.	Number of vessels during period.	Average number of vessels per month for period.	Average number of vessels per month since opening of canal.	Per cent above or below normal.	Per cent above or below previous record.
Aug. 15 to Dec. 1914	351	78.0	78.0	.....	.....
Jan. to June 1915	721	120.2	102.2	+17.7	+ 54.0
July to Dec. 1915	428	71.3	90.9	−21.3	− 40.6
Jan. to June 1916	332	55.3	81.4	−32.1	− 22.4
July to Dec. 1916	890	148.3	95.5	+55.3	+169.0
Jan. to June 1917	916	152.7	105.4	+44.8	+ 3.0
July to Dec. 1917	1,044	174.0	115.5	+50.6	+ 13.9
Jan. to June 1918	1,024	170.3	122.7	+38.8	− 2.1
July to Dec. 1918	1,048	174.7	128.6	+35.8	+ 2.6
Jan. to June 1919	980	163.3	132.2	+23.5	− 6.5
July to Dec. 1919	1,154	192.3	137.8	+39.6	+ 17.8
Jan. to June 1920	1,324	220.7	144.9	+52.4	+ 14.8

PROPOSED LEGISLATION CONCERNING BRAZILIAN NAVY.

Source: Reliable.

(13219.)

15 September, 1920.

On 14 September, 1920, there were introduced in the Chamber of Deputies several bills concerning the Brazilian Navy, of which the two following are of interest.

Bill No. 393–1920 authorizes the establishment of a hydrographic service for the purpose of making a complete survey of the Brazilian coast, as well as the establishment of a weather bureau for forecasting weather. The bill authorizes the construction of three special ships for this purpose.

Bill No. 393–1920 authorizes the Government to complete the naval program of 1906 by the construction of three light cruisers, eight submarines, and such tugs as are necessary.

The bill provides that as much as possible of this work shall be done in Brazil and that preference shall be given to Brazilian materials, both raw and fabricated.

These bills were referred to the committees on war, navy, and finance, and their further progress will be reported.

REVIVAL OF AMERICAN MERCHANT MARINE.

Source: Reliable.

6 October, 1920.

During September, for the first month since the armistice, according to returns of the Bureau of Navigation, Department of Commerce, the increase in the American seagoing merchant marine owned by American shipowners has equaled and exceeded the increase in the Government owned ships built with appropriations by Congress. At the last session Congress in the appropriation bills changed the war policy and directed the Shipping Board to maintain itself by sales of ships and shore property without further appropriations. During September the fleet of seagoing ships of 500 gross tons or over of American shipowners rose to 1,829, of 4,625,324 gross tons, an increase during the month of 25 ships of 116,335 gross tons, while the Government owned tonnage during the month increased only 20 ships of 88,855 gross tons, giving a Shipping Board total of 1,689 ships, of 7,288,208 gross tons, on October 1. Since January 1, 1920, however, the Government owned tonnage has increased by 233 ships, of 1,347,466 gross tons, while the commercial marine of American shipowners has increased only 129 ships, of 536,926 gross tons.

COST OF AMERICAN FORCES IN GERMANY.

Source: Reliable.

9 October, 1920.

The total cost of the American forces in Germany from the beginning of the occupation to June 30, 1920, amounted to $257,065,084.35. This sum includes maintenance (officers, men, animals), charges peculiar to the Army (civilian labor, rentals and billets, claims), and a net debit (surveys, salvage sales, etc.).

Under the terms of the armistice Germany is obliged to reimburse the United States for the cost of the American forces in Germany. To June 30, 1920, Germany had paid on this account $34,724,658.78, including credits for sales, leaving a net balance due the United

States of $222,340,425.57. Up to date no difficulty has been experienced in getting paper marks as needed from the German Government, and no future difficulties are anticipated in this respect.

EXPLOSION ON "HARUNA."

Source: Reliable.

(1463–A.)

22 September, 1920.

On September 12, at 4.50 p. m., while the *Haruna*, flagship of the Second Squadron, was conducting gun practice off Machitazaki, west coast of Hokkaido, an explosion occurred in No. 1 14-inch gun turret. Lieut. Hamada, commanding the turret, and four others were killed. Chief Warrant Officer Acki and eight others were severely wounded and numerous others were slightly wounded.

The cause of the explosion has not been definitely determined, but it has been stated that the gun was fired before the breech was entirely closed.

One gun in the turret was damaged beyond repair; the other one was but slightly damaged.

No damage was done to the turret itself or handling room.

A board of investigation has been convened.

LIST OF VESSELS OF GERMAN NAVY.

Source: Reliable.

(10429.)

21 September, 1920.

The "Journal de la Marine" of 10 July, 1920, contains a list of the ships making up the German Navy of the present moment, according to the stipulations of the Peace Treaty of Versailles, namely:

1. Six battleships: "*Schlesien*," "*Schleswi-Holstein*," "*Hanover*," "*Hessen*," "*Elsass*," and "*Braunschweig*."

2. Six light cruisers: "*Berlin*," "*Hamburg*," "*Arkone*," "*Medusa*," "*Thetis*," and "*Amazone*."

3. Twelve chasers: *G 8–10–11; S 18–19; V 2–3–5–6; T 185–190–196.*

4. Twelve torpedo boats: *99–101–102–103–104–105–106–107–108–109–110–113.*

RUSSIANS IN GERMANY.

Source: Reliable.

(13631.)

17 September, 1920.

A press telegram from Berlin to the Nieuwe Rotterdamsche Courant dated September 13 states as follows:

According to information obtained at the German Ministry of Foreign Affairs, there are 450,000 Russians in Germany. Amongst

them are 180,000 prisoners taken during the World War, 60,000 who crossed the East-Prussian frontier in the war against Poland and were interned, 200,000 "whites" or Monarchist refugees, and more than 10,000 Reds.

THE TSUGARU CABLE.

Source: Reliable.

(11954.)

3 September, 1920.

From the farthest point of Hokkaido to the end of Kyushu telegraphic communication will be possible when the Tsugaru Straits cable connecting Honsho and Hokkaido is completed.

The expenses have already been covered by an appropriation and the cable will be in commission next year.

AVIATION.

AIRSHIPS — PROTECTION FROM ELECTRIC SPARKING CAUSED BY ATMOSPHERIC ELECTRICITY AND WIRELESS TELEGRAPHY.

Source: Reliable.

(13497.)

A free balloon or airship in flight is very much less exposed to danger from atmospheric electrical disturbances than is a captive balloon. The precautions taken to protect an airship against the dangers of sparking caused by the use of the wireless apparatus will probably be effective also against any atmospheric electric disturbances other than those from thunderstorms in close proximity to the ship.

When, however, the atmospherics received on the wireless-telegraph gear are of such intensity as to indicate that dangerous disturbances are about, the fact should be at once reported to the captain, and the aerial or other hanging conductors should be reeled in. To avoid danger from sparking, whether due to wireless-telegraph apparatus or atmospheric electrical disturbances, it is essential that all parts of the ship and structure should be effectively bonded together.

The following general instructions have been drafted for guidance as to how this is to be carried out in the various classes of airships, but the general principle underlying these instructions is to be systematically applied to insure that all metal parts shall be at the same mean electrical potential under all circumstances in order that effective protection may be obtained.

Bonding wires where considerable slack may be necessary are not to be made up in a spiral coil, as the inductive resistance of such a bond would be high, and render it unsuitable for protection against the high-frequency currents involved.

Rigid Airships of Duralumin Construction.

Flexible joints in framework, control wires, metal parts of gas valves, and similar movable portions, are to be bonded by means of a flexible copper cord, as used for carbon brush flexibles. Where possible, eyelets are to be pressed on to the flexible bond and are to be secured to the metal by means of screws with spring washers. In other instances the bond may be bound to the metal parts with a

copper binding wire, 24 S. W. G., for a length of not less than 1 inch, or by other approved means. Where the motion of the mass to be bonded is considerable (e. g., the disk of a gas valve) or where mechanical considerations demand it, bonding is to be carried out by means of stranded steel wire of smaller sectional area, about 3/23 S. W. G., provided the electrostatic capacity of the masses to be bonded is small. If steel wire is used, a brass thimble is to be sweated on the end for connecting purposes.

The bonding is to be carried out on fixed masses by means of copper wire of not less sectional area than 14 S. W. G. Framework and other articles secured by bolting or riveting are considered to be sufficiently bonded, and, generally speaking, bonding will not be necessary when the mechanical arrangement is such that pressure is always maintained between the separate parts such as might apply with control wires, although in particular instances it may be necessary to supplement the contact by separate bonds.

Rigid Airships of Wooden Construction.

In this class of ship, i. e., H. M. A. *31* and *32*, the earthing system is to be supplemented by running a loop of copper wire of not less than 7/21 S. W. G. through the keel on the under side of Nos. 1 and 20 longitudinals. The wire is to be secured to the bolts holding the circumferential wires by means of a nut and spring washer. This loop of copper wire is also to make connection to the keel-joint plates, and will therefore act as a main feeder. A little slack should be allowed in the wire to insure that no strain comes upon it. The tonetising of the wires and keel plates causes no insulation of serious importance in cases where the mechanical arrangement is such that pressure is always maintained between the separate parts. Great care, however, must be taken in continuity tests on a ship of this construction, and the joints must either be cleaned or bonded where the electrical conductivity is not of the highest order.

Nonrigid Airships.

The whole of the metallic parts of the car, the engines and the petrol system, which includes both externally and internally slung tanks, are to be connected to one complete earthing system. In wooden cars a copper strip $\frac{1}{4}$ by $\frac{1}{32}$ inch on the underside of the main longerons forms a complete loop around the car, and any insulated masses of metal are to be interconnected by means of similar sized copper strips which will act as feeders to the main system. It will be found necessary in S. S. T. ships to run a copper strip from either engine down the engine bearer to the main longeron.

Owing to the high inductive capacity of the long steel control wires on a North Sea ship and the considerable capacity of her planes, a light copper wire is to be run between the plane system and the

car. The various parts of the plane system are to be carefully interconnected.

Electrical bonding of insulated gaps such as those at the cord lanyards in rigging, control wires, valve lines, rip lines, plane guys, etc., is to be carried out by means of a 60/40 copper cord firmly bound to the wire with 24 S. W. G. copper wire. On nonrigid ships carrying a top gun, the gun, gun ring, and all metallic parts are to be included in the earth system by connecting to the metal voice pipe, which runs down to the car.

Petrol System.

Wherever any oil, petrol, or water pipes are connected by joints of india rubber or other insulating material, electrical continuity is to be effected by bringing the insulated gaps by means of a copper cord (60/40) secured to the piping by means of a metal clip. This cord is also to be taken under the metal hose clips. Care should be taken to see that the surface of the pipe is previously cleaned bright.

Tests for Electrical Continuity.

Bonding and testing for continuity on airships of new construction is to be carried out to the satisfaction of the overseer, and in cases of doubt the matter is to be referred to the Admiralty for decision.

A record of all tests, especially those carried out in connection with gas valves and similar movable portions, should be made and a copy sent to the Admiralty.

All ships in commission are to be tested by the wireless-telegraph officer at least once a month and a record of the test to be forwarded with the monthly wireless-telegraph report. An easy and effective continuity test can be made by means of a pair of ordinary telephones with a small dry cell carried on the headband and one wandering lead attached to a convenient point in the ship's earthed circuit. Another terminal, used to touch various metal parts, at once indicates whether there is satisfactory continuity. Where an imperfect or interrupted connection is suspected, test is to be made by means of a megger.

INFORMATION ON LEITNER-WATTS METAL PROPELLER—DETACHABLE BLADE TYPE RECENTLY EXHIBITED AT THE AERONAUTICAL EXHIBITION AT OLYMPIA, LONDON.

Source: Reliable.

(13598.)

It is the belief of this company that a detachable blade metal propeller will definitely supplant the wooden type, and that the former is a necessity to all civil and military types of aircraft. For

some types of machines the need for application of metal propellers is most apparently urgent. Three-blade propellers, which are very advantageous, are practically impossible to construct in wood, but are eminently suitable for metal construction.

It is believed that the metal propeller can be manufactured as a mass-product article at a moderate cost, and sold at a substantial profit, with great resulting economy to the purchaser, as it retains its shape, does not splinter, pit, fray, or warp, and one of this type therefore replaces a large number of wooden ones.

Unlike the wooden propeller, the metal propeller does not change in shape when stocked, it can be manufactured for stock instead of having to be especially made for every individual customer, consequently steady and large production can be relied on, and arrangements for immediate delivery from stock can thus be made. This feature alone, it is believed, will enable the capture of the world market to be effected with great rapidity.

Finally, there is claimed to be great economy in packing, transport, and repairs. A damaged blade can be replaced in situ. A wooden propeller, once damaged, can only be scrapped.

The following report of the Royal Aircraft Establishment, Farnborough, on the spinning tests of the Leitner-Watts metal air screw may be of interest:

Spinning test No. 3.

Rotational speed (r. p. m.)	B. H. P. at N. T. P.
1,209	169
1,315	196
1,404	246
1,463	297
1,575	351

Geared drive.

Temperature: 63° F.

Barometer: 29.87 inches Hg.

Two-blade propeller made for Bristol aeroplane, fitted with Siddeley Puma 240 H. P. at 1,400 r. p. m. Three tests were taken, and for the third test the pitch was reduced, by request, to 2,200 M/M at 3.4 radius; this can not be done with any ordinary propeller, but was accomplished on the "Leitner-Watts" metal propeller in a few minutes.

AMPHIBIAN COMPETITION AT MARTLESHAM HEATH AND FELIXTOWE.

Source: Reliable.

(13094–B.)

27 September, 1920.

The Vickers machine gets off the water after a run of approximately 200 yards and climbs almost like a scout. It was noted, however, that it makes very heavy weather of taxying even in smooth water and porpoises badly even after perfect landings. In this

respect the Supermarine is superior, being very much drier and holding the water better after landing. Incidentally, the land chassis of the Supermarine, while not so clean in design as the Vickers, appears to be stronger, which conviction would be borne out by the accident to the Vickers while taxying on the Martlesham Heath Aerodome. When traveling at about 45 miles per hour, the left one of the phosphor-bronze cone castings which act as pivots on which the landing gear is swung in and out of position, cracked and the left wheel dished itself and tore out the claw flitting away from the flange. The boat hull took the ground and simply spun around without doing any more damage and merrily shaking up the personnel. If an accident of this kind had happened to a land machine, the eventualities would have been infinitely more serious.

From a purely seagoing point of view the Supermarine appears to be the best of the three entries, and if it was fitted with a Napier engine instead of an Eagle VIII its performance should compare favorably with that of the Vickers.

The Fairey is simply a makeshift job and should not be considered seriously. It is inferior to both the Vickers and Supermarine.

The checking of the weight of the "Viking" before and after its 24-hour mooring-out test showed that while water-borne it had taken on nearly 140 pounds additional weight.

The hull of the Supermarine was designed to take a load of 3,500 pounds. During her getting-off tests at Felixstowe the total weight of the machine was nearly 5,400 pounds. It is estimated that it takes a run of a least 350 yards to get off the water and climbs with difficulty. It is obviously underpowered.

The taxying tests requires a half hour run on the water at a speed of not less than 10 knots. Figure-of-eight turns around buoys are also required.

Gen. Sykes remarked that the competitions at Martlesham and Felixstowe had demonstrated two things, viz., that the Napier Lion engine was the best aero engine produced by the British industry and that you can get an excellent performance from any machine provided you give it enough power.

INCREASE IN NAVAL AVIATION.

Source: Japanese Press.

(12484.)

19 August, 1920.

In accordance with a provision in the recent budget the Minister of the Navy has a project for increasing the naval aviation by 15 new aerial corps and 2 training corps. At present, there are only two such corps, one at Yokosuka and the other at Sasebo. This is a

very weak force compared to the other great powers. The Navy is now busily engaged in the construction of the 8–8 fleet, and a sufficient complementary aerial force is a necessity; for that reason we see the great increase from 2 corps to 15 new corps and 2 training corps. The project will be started immediately and should be completed by 1923. The corps will be stationed as follows:

Naizuru Naval Station	1
Kure Naval Station	4
Sasebo Naval Station	5
Yokosuka Naval Station	5

The establishment of these corps will not complete the naval aviation plans. Plans are being zealously rushed looking to the employment of army style aeroplanes on battleships. For this purpose, ships already in commission will make the necessary preparations for carrying airplanes.

Some of the battle cruisers of the 8–8 fleet, such as the *Akagi*, *Amagi*, *Atago*, *Takao;* the dreadnaughts *Nagato*, *Mutsu*, *Kaga*, and *Tosa;* the 4 battle cruisers provided by the present budget; also the 4 battleships and the 12 cruisers all will carry aeroplanes. Recently the naval authorities placed an order with the Saano Shipbuilding Co. for a large aeroplane tender, modeled after the British *Argus*, to be completed by 1922. This tender will be named the *Hosho* and will be of the newest design.

The naval authorities will make a very careful selection of aeroplane models for use on board the battleships, and for this purpose have an appropriation of 235,000 yen for this year and next year as well. The aviation field at Kasumigaura, in Ibaraki Ken, which was established by the navy some time ago, is to be used for experiment with army machines.

CLOSING OF SOPWITH AVIATION CO. AND INFLUENCE ON COMMERCIAL-AIRCRAFT ACTIVITIES OF COST IN PRICE OF PETROL.

Source: Reliable.

(13332.)

The closing of the Sopwith Aviation & Engineering Co. came as a surprise to the aviation industry, but it reflects the unstable condition of commercial aviation enterprise in this country at the present time.

Now that the service requirements are cut down, concerns such as the Sopwith Co. have to depend largely on commercial enterprise for a market for their products. Comparatively recently two other aviation firms were lost to the industry, namely, The Alliance

Aeroplane Co. and the British Nieuport Aviation Co. Both of these firms were owned by Sir Samuel Waring.

Through the increase in the price of high-proof petrol by 7 pence per gallon it is feared that the successful future of commercial aviation enterprise in this country will be further jeopardized. Figures given by Messrs. Handley-Page in connection with the increased cost of the Paris-to-London service are significant. An increase of £8 is added to the cost of a return journey.

There is agitation at the present time to promote legislation for the compulsory carbonization of every ton of coal used in order that volatiles may be recovered instead of being dissipated in the atmosphere.

MANUFACTURE OF AIRPLANE MOTORS IN JAPAN.

Source: Reliable.

(12914.)

3 September, 1920.

Competent workmen can not be found in Japan for the manufacture of aeroplane motors. The mechanic class simply does not exist, and there is no great body of skilled mechanics to draw from as in Europe and America. In Japan workmen are recruited from anywhere, and their training is haphazard at best. Good workmen are few, and these are usually old men.

The new aeroplane motor arsenal at Kiki (Nagoya) has suffered much from lack of competent workmen. The specialists, already few in numbers, prefer to remain in Tokyo and Osaka, where they are in great demand. The number of foremen is in general sufficient, and those who have been abroad especially possess some good qualities. They are good copyists, have good theoretical capacity, but less often practical capacity. Unfortunately, these good qualities fail when confronted with the fear of responsibility. They are extremely lacking in energy, yet try to render themselves indispensable. In general they are good, though servile, copyrights; they work without effective organization and with extreme slowness.

MILITARY AVIATION MATERIAL SOLD BY FRANCE TO BRAZIL.

Source: Reliable.

(13449.)

On 27 August, 1920, Col. Magnin, of the French Army, arrived in Rio de Janeiro from France, bringing with him aviation material from France for the military aviation school, which material had been ordered by the Brazilian Government. It comprises 85 aeroplanes as follows: 20 Spads, 20 Biguet, 45 Nieuport, all of high

power. Thirty-five additional motors and aeroplane material were brought.

This material was sold to the Brazilian Government, it is stated, at a low price, owing to the fact that the French laws forbid making gifts of Government property.

NAVY AERODROME IN ISE BAY.

Source: Reliable.

(7210.)

3 September, 1920.

The Navy Department has for some time been looking for a suitable place on Ise Bay for the establishment of an aerodrome for hydroplanes. The choice of sites has now come down to either Tomita-mura, Miye-gun, or Oyedo-mura, Watarai-gun.

NAVY DEPARTMENT,
BUREAU OF CONSTRUCTION AND REPAIR,
Washington, D. C., October 10, 1920.

Vessels under construction, United States Navy—Degree of completion and probable dates of completion as reported Sept. 30, 1920.

Type, number, and name.	Contractor.	Per cent of completion.				Contract date of completion.	Probable date of completion.
		Oct. 1, 1920.		Sept. 1, 1920.			
		Total.	On ship.	Total.	On ship.		
BATTLESHIPS.							
44. California	Mare Island Navy Yard	94.2	92.6	93.6	91.8		Jan. 1, 1921
45. Colorado	New York Shipbuilding Corporation.	59.5	54.2	57.6	51.4		June —, 1922
46. Maryland	Newport News Shipbuilding & Dry Dock Co.	81.6	80.4	79.4	77.9		July —, 1921
47. Washington	New York Shipbuilding Corporation.	51.5	41.9	50.2	39.8		Apr. —, 1923
48. West Virginia	Newport News Shipbuilding & Dry Dock Co.	33.5	19.5	32.5	17.5		
49. South Dakota	New York Navy Yard	15.4	7.6	14.5	6.7		
50. Indiana	do	12.1	4.3	11.5	3.7		
51. Montana [1]	Mare Island Navy Yard	12.6	5	11.2	4		
52. North Carolina	Norfolk Navy Yard	15.4	9.4	14.7	8.6		June 1, 1923
53. Iowa	Newport News Shipbuilding & Dry Dock Co.	7.7	4.6	6.5	4.1	July 12, 1923	
54. Massachusetts	Bethlehem Shipbuilding Corporation (Fore River).					do	Nov. —, 1923
BATTLE CRUISERS.							
1. Lexington	do	2.1	.3	1.3	.3		Sept. —, 1923
2. Constellation	Newport News Shipbuilding & Dry Dock Co.	1.7	.3	.9	.1		
3. Saratoga [2]	New York Shipbuilding Corporation.	4.2	1.1	3.1	.4		
4. Ranger	Newport News Shipbuilding & Dry Dock Co.	.8	.2	.7			
5. Constitution [2]	Philadelphia Navy Yard	1.1	.4	1	.3		
6. United States [2]	do	1.1	.4	1	.3		
SCOUT CRUISERS.							
4.	Todd Dry Dock & Construction Corporation.	70.1	61.4	64.9	54	Aug. 1, 1921	Nov. —, 1921
5.	do	61.4	52.6	56.1	44.4	Dec. 1, 1921	Apr. —, 1922
6.	do	40.6	19.6	37.4	14.8	July 1, 1922	July —, 1922
7.	Bethlehem Shipbuilding Corporation (Fore River).	18.2	8.7	13.3	6.6	Aug. 1, 1921	Nov. —, 1921
8.	do	17	7.5	12.6	5.9	Nov. 1, 1921	Feb. —, 1922
9.	Wm. Cramp & Sons Co	53		52			Aug. 1, 1921
10.	do	52		51			Sept. 15, 1921
11.	do	29		27		Oct. 1, 1921	Nov. 15, 1921
12.	do	29		28		Jan. 1, 1922	Dec. 15, 1921
13.	do	22		21		Apr. 1, 1922	Feb. 15, 1922
MISCELLANEOUS. [3]							
Fuel ship No. 17, Neches.	Boston Navy Yard	98.5	98.5	95	94.3		Oct. 30, 1920
Fuel ship No. 18, Pecos.	do	39	34.5	36	29		Oct. —, 1921

[1] Keel laid Sept. 1, 1920.
[2] Keel laid Sept. 25, 1920.
[3] Authorized but not under construction or contract: (1) Transport No. 2.

NOTE.—Aircraft tender U. S. S. Wright will probably be delivered to the contractors for conversion Oct. 15, 1920.

Vessels under construction, United States Navy—Degree of completion and probable dates of completion as reported Sept. 30, 1920—Continued.

Type, number, and name.	Contractor.	Per cent of completion.				Contract date of completion.	Probable date of completion.
		Oct. 1, 1920.		Sept. 1, 1920.			
		Total.	On ship.	Total.	On ship.		
MISCELLANEOUS—continued.							
Gunboat No. 22	Charleston Navy Yard	61.4	49.4	58.4	46.1		Sept. 30, 1921
Hospital ship No. 1, Relief.	Philadelphia Navy Yard	98.5	98	96.5	95.5		Dec. 15, 1920
Ammunition ship No. 2, Nitro.	Puget Sound Navy Yard	99.2	97.6	98.9	96.6		Dec. 31, 1920
Repair ship No. 1, Medusa.	do	42	35	53.5	43.5		Aug. 31, 1921
Destroyer tender No. 3, Dobbin.	Philadelphia Navy Yard	31.5	31	29.7	29		Nov. 15, 1921
Destroyer tender No. 4, Whitney.	Boston Navy Yard	3	1.5	1.5	1		Oct. —, 1922
Submarine tender No. 3, Holland.	Puget Sound Navy Yard	6		5.5			
OIL TANKER.							
1661. Trinity	Newport News Shipbuilding & Dry Dock Co.			[4] 99		Mar. 1, 1920	
SEAGOING TUGS.							
37. Iuka	Staten Island Shipbuilding Co.	98		95		May 3, 1919	Oct. 28, 1920
38. Keosauqua	do	93		90		May 10, 1919	Nov. 25, 1920
39. Montcalm	do	88		85		May 17, 1919	Dec. 20, 1920
DESTROYERS.[5]							
135. Tillman	Charleston Navy Yard	96.1	88.4	92.8	86.1		Dec. 30, 1920
219. Edsall	Wm. Cramp & Sons Co	85		79			Nov. 19, 1920
221. Simpson	do	90		86			Oct. 29, 1920
224. Stewart	do	[6]		[5] 95			
225. Pope	do	95		88			Oct. 15, 1920
226. Peary	do	92		87			Oct. 19, 1920
227. Pillsbury	do	82		76			Dec. 3, 1920
228. Ford	do	75		69			Dec. 23, 1920
229. Truxtun	do	71		67			Jan. 10, 1921
230. Paul Jones	do	68		63			Jan. 25, 1921
237. McFarland	New York Shipbuilding Corporation.	[7]		[6] 98.2			
238. James K. Paulding.	do	94		89.2			Nov. 12, 1920
240. Sturtevant	do	[8]		[7] 99.5			
241. Childs	do	96.5		90			Oct. 19, 1920
242. King	do	92		86.5			Nov. 24, 1920
243. Sands	do	95		89.5			Nov. 2, 1920
244. Williamson	do	96		94.5			Oct. 26, 1920
245. Reuben James	do	[9]		[8] 99.7			
246. Bainbridge	do	83		79.			
247. Goff	do	85.2		79.2			
248. Barry	do	86.5		80			
249. Hopkins	do	80		74			
250. Lawrence	do	77.5		72			
307. Paul Hamilton.	Beth. Shipbuilding Corporation (San Francisco).	[10]		[9] 91 1	89		
308. William Jones	do	[11]		[10] 87.5	84.3		
309. Woodbury	do	93.3	91.8	83.6	79.4		Oct. 18, 1920
310. S. P. Lee	do	88.1	85.1	81.7	[12] 77		Oct. 25, 1920
311. Nicholas	do	84.9	81.1	79.9	74.7		Nov. 12, 1920
312. Young	do	83.7	79.5	77.8	72		Nov. 27, 1920
313. Zeilin	do	79.9	74.7	73.3	65.9		Dec. 10, 1920
314. Yarborough	do	73.5	66.1	73.5	66.1		Dec. 24, 1920
315. LaVallette	do	73.8	66.5	73.8	66.5		Dec. 31, 1920
316. Sloat	do	73.5	65.8	73.5	65.8		Jan. 10, 1921
317. Wood	do	72	64.1	72	64.1		Jan. 25, 1921

[4] Delivered Aug. 4, 1920.
[5] Destroyers authorized but not under construction or contract: (12) Nos. 348 to 359, inclusive.
[6] Delivered Sept. 15, 1920.
[7] Delivered Sept. 30, 1920.
[8] Delivered Sept. 21, 1920.
[9] Delivered Sept. 24, 1920.
[10] Delivered Sept. 24, 1920.
[11] Delivered Sept. 30, 1920.

Vessels under construction, United States Navy—Degree of completion and probable dates of completion as reported Sept. 30, 1920—Continued.

Type, number, and name.	Contractor.	Per cent of completion. Oct. 1, 1920. Total.	Oct. 1, 1920. On ship.	Sept. 1, 1920. Total.	Sept. 1, 1920. On ship.	Contract date of completion.	Probable date of completion
DESTROYERS—con.							
318. Shirk	Beth. Shipbuilding Corporation (San Francisco)—Continued.	73.8	66.5	73.8	66.5		Feb. 7, 1921
319. Kidder	do	73.8	66.5	73.8	66.5		Feb. 18, 1921
320. Selfridge	do	73.7	66	73.7	66		Mar. 5, 1921
321. Marcus	do	73.1	65.3	73.1	65.3		Mar. 15, 1921
322. Mervine	do	73	65.3	73	65.3		Mar. 30, 1921
323. Chase	do	72.9	65.2	72.9	65.2		Apr. 11, 1921
324. Robert Smith	do	75.9	68.4	75.9	68.4		Apr. 26, 1921
325. Mullany	do	76.7	70.6	76.7	70.6		May 5, 1921
326. Coghlan	do	77	71.2	77	71.2		May 17, 1921
327. Preston	do	75.7	69.3	75.7	69.3		May 30, 1921
328. Lamson	do	75.9	69.6	75.9	69.6		June 10, 1921
329. Bruce	do	(13)		[12]93.9	92.6		
330. Hull	do	35.6	24.4	34.3	22.9		June 24, 1921
331. MacDonough	do	49.9	41.3	43.7	34		July 7, 1920
332.	do	37.2	26.3	34.3	22.9		July 19, 1921
333. Sumner	do	62	54.5	61.4	53.7		July 30, 1921
334.	do	35.4	24.2	34.3	22.9		Aug. 10, 1921
335.	do	35.4	24.2	34.3	22.9		Aug. 25, 1921
337. Zane	Mare Island Navy Yard	99.2	99.2	99	99		Dec. 15, 1920
338. Wasmuth	do	95	94.6	93.7	93.2		
339. Trever	do	91.4	91	90.1	89.6		
340. Perry	do	51.6	49.6	50.7	48.6		
341. Decatur	do	47.8	45.8	46.9	44.8		
342. Hulbert	Norfolk Navy Yard	99.8	99.8	99.5	99.4		Oct. 11, 1920
343. Noa	do	98.8	98.8	98.2	98.1		Nov. 1, 1920
347. Pruitt	Bath Iron Works	(14)		[14]100	100		
SUBMARINES.[15]							
60. T–. [16]	Electric Boat Co. (Quincy).	96.9	96.9	96.9	96.9	Oct. 2, 1918	Dec. 1, 1920
61. T–3 [16]	do	99	99	99	99	do	Oct. 15, 1920
113. S–8	Portsmouth, N. H., Navy Yard.	95.4	95.3	92.6	92.4		[17]Oct. —, 1920
114. S–9	do	84.3	83.9	82.5	82		Feb. —, 1921
115. S–10	do	69.6	69	67	66.4		
116. S–11	do	51.7	50	48.1	46.2		
117. S–12	do	44	42	42	39.9		
118. S–13	do	41.8	38	40.2	35.9		
119. S–14	Lake Torpedo Boat Co. (Bridgeport).	97.1	97.1	96.1	96.1	July 12, 1919	Nov. 1, 1920
120. S–15	do	96.3	96.3	95.1	95.1	Aug. 12, 1919	Dec. 1, 1920
121. S–16	do	97.7	97.7	94.9	94.9	Sept. 12, 1919	Nov. 1, 1920
122. S–17	do	91.6	91.6	87.1	87.1	Oct. 12, 1919	Dec. 15, 1920
123. S–18	Electric Boat Co. (Quincy).	96.4	96.4	96.2	96.2	Feb. 17, 1919	Dec. 1, 1920
124. S–19	do	95.4	95.4	94.6	94.6	Mar. 17, 1919	Dec. 15, 1920
125. S–20	do	96.6	96.6	95.2	95.2	do	Nov. 1, 1920
126. S–21	do	94	94	93.2	93.2	Apr. 17, 1919	Jan. 1, 1921
127. S–22	do	94.8	94.8	93.9	93.9	do	Dec. 15, 1920
128. S–23	do	93.2	93.2	92.5	92.3	May 17, 1919	Feb. 1, 1921
129. S–24	do	91.5	90.5	90.9	89.4	do	Mar. 30, 1921
130. S–25	do	92.2	91.7	91.5	90.5	June 17, 1919	Mar. 6, 1921
131. S–26	do	90.8	89.3	90.2	88.2	do	Apr. 15, 1921
132. S–27	do	89	86.5	88	84.6	do	May 15, 1921
133. S–28	do	90	88	89	86	July 17, 1919	May 1, 1921
134. S–29	do	88	85	87.2	83.5	do	June 1, 1921
135. S–30	Electric Boat Co. (San Francisco).	98.9	98.7	97.8	97.6	Nov. 17, 1918	Oct. 11, 1920
136. S–31	do	92.9	91.6	92	90.5	Dec. 17, 1918	Nov. 15, 1920
137. S–32	do	91	[18]89.2	90.2	89	do	Dec. 7, 1920
138. S–33	do	96.7	96.3	94.4	93.7	Jan. 17, 1919	Oct. 30, 1920

[12] To correct error in previous report.
[13] Delivered Sept. 29, 1920.
[14] Delivered Sept. 2, 1920.
[15] Submarines authorized, but not under construction or contract: Fleet submarines (6), Nos. 166 to 171; Neff submarine (1) No. 108.
[16] Formerly Submarines AA–2 and AA–3.
[17] Commissioned Oct. 1, 1920.
[18] To correct error in previous report.

Vessels under construction, United States Navy—Degree of completion and probable dates of completion as reported Sept. 30, 1920—Continued.

Type, number, and name.	Contractor.	Per cent of completion.				Contract date of completion.	Probable date of completion.
		Oct. 1, 1920.		Sept. 1, 1920.			
		Total.	On ship.	Total.	On ship.		
SUBMARINES—con.							
139. S-34	Electric Boat Co. (San Francisco)—Continued.	83.4	79.9	80.6	78.4	Jan. 17, 1919	Dec. 27, 1920
140. S-35	do	75.5	70.2	74.2	67.8	do	Jan. 18, 1921
141. S-36	do	73.3	66.6	73.3	66.6	Feb. 17, 1919	Feb. 10, 1921
142. S-37	do	70.8	63.5	70.8	63.5	do	Mar. 5, 1921
143. S-38	do	71.1	63.9	71.1	63.9	do	Apr. 1, 1921
144. S-39	do	67.2	59.7	67.2	59.7	Mar. 17, 1919	May 25, 1921
145. S-40	do	57	48.9	57	48.9	do	June 20, 1921
146. S-41	do	55.7	45.9	55.7	45.9	do	July 15, 1921
153. S-42	Electric Boat Co. (Quincy).	26.8	11	22.2	8.4	Dec. 30, 1920	Oct. —, 1921
154. S-43	do	26.8	11	22.2	8.4	Jan. 30, 1921	Nov. —, 1921
155. S-44	do	26.8	11	22.2	8.4	Feb. 28, 1921	Nov. —, 1921
156. S-45	do	26.8	11	22.2	8.4	Mar. 30, 1921	Dec. —, 1921
157. S-46	do	26.8	11	22.2	8.4	Apr. 30, 1921	Dec. —, 1921
158. S-47	do	26.8	11	22.2	8.4	May 30, 1921	Jan. —, 1922
159. S-48	Lake Torpedo Boat Co. (Bridgeport).	57.4	51	50.7	45.1	July 1, 1921	July 1, 1921
160. S-49	do	49.2	42.9	46.1	40.2	Aug. 1, 1921	Aug. 1, 1921
161. S-50	do	47.3	40.5	42	36.1	Sept. 1, 1921	Sept. 1, 1921
162. S-51	do	48.5	41.9	44.1	38.4	Oct. 1, 1921	Oct. 1, 1921
163. V-1	Portsmouth, N. H., Navy Yard.						
164. V-2	do						
165. V-3	do						

OFFICE OF NAVAL INTELLIGENCE.
NAVY DEPARTMENT.
Washington, D. C.

MONTHLY INFORMATION BULLETIN.

NUMBER 12—1920.

15 DECEMBER, 1920.

DISTRIBUTION:

In general: Bureaus of the Navy Department; all force commanders; all commanding officers of capital ships, the larger patrols, destroyers, submarines, and Navy transports.

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MONTHLY INFORMATION BULLETIN.

NUMBER 12—1920—15 DECEMBER 1920.

FOR CONVENIENCE IN ROUTING.

Officer.	Initials.	Date received.	Date forwarded.
Captain			
Executive Officer			
First Lieutenant			
Navigating Officer			
Gunnery Officer			
Communication Officer			
Engineer Officer			
Medical Officer			
Supply Officer			
First Division Officer			
Second Division Officer			
Third Division Officer			
Fourth Division Officer			
Fifth Division Officer			
Marine Officer			

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OPERATIONS.

EXPERIMENTAL TORPEDO FIRING, UNITED STATES PACIFIC FLEET.

The accompanying correspondence concerning the experimental torpedo practice of the United States Pacific Fleet is published for the information of the service.

SAN DIEGO, CALIF.,
14 June 1920.

From: Commander Special Destroyer Flotilla.
To: Commander Destroyer Squadron, United States Pacific Fleet.

Subject: Experimental Torpedo Practice.

1. In accordance with orders from commander destroyer squadrons, United States Pacific Fleet, an experimental torpedo practice was carried out by a special flotilla from Pacific destroyer squadrons on 12 June.

2. Target consisted of the *Idaho* and *Mississippi.*

3. Destroyers were placed in position as directed by commander in chief Pacific Fleet, and at 9 a. m. started ahead in column, course 335, speed 20. Order of vessels in formation was:

FLOTILLA LEADER—*Claxton.*
DIVISION 1—*Sproston*, *O'Bannon*, *Howard*, *Swasey*, *Renshaw*, *Roper.*
DIVISION 2—*Chauncey*, *Babbitt*, *Twiggs*, *Badger*, *Fuller*, *Percival.*
DIVISION 3—*Kennison*, *Hamilton*, *McDermut*, *Philip*, *Tingey.*

4. Soon after starting seaplanes, one dirigible, and kite baloons were seen ahead. At 9.10 smoke of the battleships was sighted. At 9.11 flotilla was formed in bow and quarter line, course 290, which course was held until 9.19, when formation was changed to column, course 335.

5. Before starting the attack it was decided to use a special formation known as "Formation E." The wind was light and about 2 points on the port quarter, the speed of the ship drawing it to about 2 points on the port bow.

6. At 9.23 smoke screen was started. At 9.26 signal was sent for divisions to change course to right 90° in column. This was executed at 9.28. At 9.43 signal was made to flotilla to recover torpedoes.

7. In all 32 torpedoes were fired. No hits were reported on hulls of the battleships. All torpedoes were recovered except one from

the *Chauncey*, which was observed by seaplane to sink at the end of the run.

8. At 9.11 *Chauncey*, flagship of the Second Division, fell out, due to breakdown in steering gear. This was very realistic. The ship followed the movements of the flotilla, and her commanding officer brought her into action in the rear of the flotilla, steering with his engines, a very creditable performance.

9. Submitted herewith are various reports from division commanders and tabulated statement showing torpedoes fired.

Tabulated statement showing torpedoes fired.

Vessel.	Number of torpedoes.	Time.	Estimated course of enemy.	Estimated speed of enemy.	Offset.
Claxton	1	0930	155° true	19	2° R.
Sproston	2	0934 0930	160° true	19	352–356.
O'Bannon	2	0930. 20	174° true	19	29°–28° L.
Howard	2	0934. 48	186° true	19	6°.
Swasey	2	0930	160° true	20	2° 30′ R.
Renshaw	2	0933 0934	150° true	19	19°–21° R.
Roper	2	0936 0941	155° true	19	0.
Chauncey	2	0942. 45 0936	280° true	19	30° L. 29° R.
Babbitt	2	0936. 30 0938. 30	140° true	19	20° R.
Twiggs	2	0940. 30	155° true	19	13° R. 20° R.
Badger	2	0940	135° true	20	15° R.
Fuller	2	0937	163° true	19	22°.
Percival	2	0937	155° true	19	34°.
Kennison	2	0941. 20 0946. 25	170° true 135° true	18 18	15°. 15°.
Hamilton	1	0946. 25	145° true	19	16°.
McDermut	1	0944	135° true	19	5° R.
Philip	2	0943. 30 0948. 50	170° true 140° true	19 19	18° L. 21° R.
Tingey	1	Unknown.	130° true	19	16°.

U. S. S. "Sproston,"
San Diego, Calif.
19 June 1920.

From: Commander Division 1, Special Flotilla.
To: Commander Special Flotilla 1.

Subject: Information requested in Commander Special Flotilla, one memorandum of 17 June 1920.

1. I am inclosing herewith reports from destroyers in Division 1 of various maneuvers and firing of torpedoes as requested in your

memorandum of 17 June. The time of the various maneuvers made by the *Sproston* are as follows:

8.38—Formation "Easy" hauled down.
9.05—Sighted enemy.
9.26—Started making smoke.
9.28—Executed "Division column right."
9.32—Stopped making smoke.
9.34—Fired first torpedo.
9.34–30—Fired second torpedo.
9.35—Started making smoke.
9.35—Went "Column right" out of action.

JAMES D. WILLSON.

U. S. S. "BABBITT,"
SAN DIEGO, CALIF.
14 June 1920.

From: Acting Commander, Division 2, Special Flotilla.
To: Commander Special Flotilla (Commander Destroyer Flotilla 5).

Subject: Movements of Division 2 in torpedo attack, 12 June 1920.

1. The following times in regard to movements of Division 2 are submitted:

(*a*) Time from hauling down "Formation easy" to firing torpedoes was 41 minutes. "Formation easy" hauled down at 8.55.

(*b*) At 9.12 ships left 45°; at 9.18 ships right 45°.

(*c*) At 9.25 signal received "Divisions column right"; executed at 9.28.

(*d*) At 9.29 signal received "Ships left," executed at 9.31.

(*e*) At about 9.34 *Babbitt* went left 90° and fired two torpedoes, one at 9.36 and one at 9.36.30.

(*f*) Ships of division maneuvered independently to clear Division 3.

S. L. HENDERSON.

U. S. S. "KENNISON."
SAN DIEGO, CALIF.
16 June 1920.

From: Commander Division 3, Special Flotilla.
To: Commander Special Flotilla.

Subject: Report of Experimental Torpedo Firing, 12 June 1920.

1. In accordance with doctrine this division changed course 111° to right of base course upon execution of signal DR and then 100° to left upon execution of signal SL. At 9.39 sighted enemy through

smoke sharp on port bow, changed to ships right 30°, and fired port torpedo at 9.41.20; range of enemy, 7,000 yards. Ships in division then in quarter line of bearing steering toward enemy. Upon firing, ships swung completely around to right, again entering smoke. Enemy changed course to left during turn. When starboard tube bore the range had changed to 3,000 yards and starboard torpedo was fired at 9.46.20.

2. Division seemed well covered by smoke screen until just prior to firing of second torpedo.

3. Signal to recover torpedoes was in air by this time and division proceeded to follow wakes.

A. Claude.

U. S. S. "Chauncey," 296,
San Diego, Calif.
14 June 1920.

From: Commander Destroyer Division 32.
To: Commander Destroyer Flotilla 5.
Subject: Experimental Torpedo Firing, 12 June 1920.

1. Time elapsed from "execute" formation easy to time torpedoes were fired by Division 2, 37 minutes. Time from "execute" formation easy to "DR," 25 minutes; to "SL," 27 minutes.

W. F. Halsey, Jr.

San Diego, Calif.
6 July 1920.

From: Squadrons Gunnery Officer.
To: Commander Destroyer Squadrons, United States Pacific Fleet.
Observations on Experimental Torpedo Practice held on 12 June 1920.

1. In accordance with instructions I observed the practice from a special seaplane placed at my disposal by the commander fleet air detachment. Due to several unavoidable delays plane was unable to leave anchorage in time to take station over destroyer formation before smoke screen was started.

2. Following is chronological order of events as observed from seaplane:

0908—Left water.

0915—Passed over pick up vessels. They seemed to be in approximately correct positions. Visibility good.

0923—Altitude 1,000 feet. On battleship course and slightly astern of them. Destroyers started smoke screen.

0925—Increased altitude to 1,500 feet and headed for weather edge of smoke screen.

0927—Could made out flotilla leader and one other destroyer. Screen very good. Do not believe battleships could see any destroyers.

0928—Easternmost destroyer in plain view. Good target.

0930—Three destroyers in plain view on eastern edge of formation.

0934—Over destroyers firing position on weather edge of screen. Screen extended up about 1,200 feet. Sighted two torpedoes.

0935—Two more torpedoes. One making surface run.

0937—Two more torpedoes, one curved left then right and steadied on its course.

0938—Three torpedoes.

0939—Four torpedoes. One torpedo circling. (NOTE.—Believe this to be the one that sank.)

Stopped counting torpedoes; too many of them in sight coming from both bows of battleships.

Battleships dodging and zigzagging to avoid torpedoes. Several misses by what looked like a very few feet.

0947—Exercise completed.

0947–1030—Searching for torpedoes.

3. My position, 500 to 1,500 feet in the air, was an excellent one from which to get a general idea of what the practice was attempting to simulate. The following are my conclusions:

(*a*) Pick-up force of destroyers, assisted by seaplanes and one dirigible, were properly disposed and were of great assistance in the recovery of torpedoes.

(*b*) Smoke screen under such weather conditions denies to the battleships all knowledge of the number of destroyers in the attacking force and their movements while in the screen.

(*c*) Aircraft and kite balloons are of very great assistance to battleships in reporting directions from which torpedoes are coming and their courses. With this information, battleships if free to maneuver can dodge torpedoes successfully.

(*d*) Torpedo speeds must be increased so that enemy, even though informed by his aircraft of approaching torpedoes, will not have so much time in which to maneuver to avoid the torpedoes.

(*e*) Every effort must be made to reduce torpedo wake so that torpedoes can not be seen so easily from aircraft.

4. I consider this practice the most valuable and instructive one that has ever been held and recommend that next year's Experimental Torpedo Practice be under practically the same rules.

San Diego, Calif.
8 July 1920.

From: Chief of Staff (observer on U. S. S. *Idaho*).
To: Commander Destroyer Squadrons, U. S. Pacific Fleet.

Subject: Experimental Torpedo Practice, Observed from Battleship.

1. On 12 June 1920, a flotilla of 18 destroyers delivered an attack from ahead, under smoke screen, upon a battleship column. For this practice the battleship column consisted of only two vessels, the *Idaho* and *Mississippi*. Battleship speed was 19 knots and change of course was limited to 30° on either side of base course. Battleships were assumed to be engaging an equal enemy force on the starboard beam. The doctrine for avoiding torpedo fire required battleships to change course independently as necessary.

2. The destroyers' approach was in one column of 18 vessels, speed 20 knots, until within about 9,000 yards of the leading battleship when they executed "Divisions column right." The first (leading) division took 30 knots, discharged torpedoes, and left a perfect smoke screen through which Divisions 2 and 3 approached. Divisions 2 and 3 executed "Ships left" as soon as division columns had completed change of direction. These divisions then proceeded in line toward battleships. Upon reaching the edge of the smoke screen Division 2 executed "Ships left," discharged torpedoes, proceeded on course a short distance, and executed a column change of about 135° to the left, coming in position to discharge torpedoes from their port tubes. Division 3 maneuvered similarly, except that they executed "Ships right" upon reaching the edge of the screen. None of these movements was visible from the battleships except those made on the edge of, or outside, the screen.

3. During the approach in column, the leading destroyer was in sight from the leading battleship for several minutes. During the maneuver "Divisions column right" the destroyers of the leading division were in sight, though rather indistinctly, through the smoke. Destroyers of Divisions 2 and 3 were not visible until they broke the edge of the smoke and turned "Ships left" and "Ships right," respectively. Even then they were only faintly visible. During this period these destroyers could have fired a number of torpedoes before being damaged to any extent by battleship gunfire. Battleship observers were unable to determine how many destroyers were in the attacking force until they came through screen.

4. Following this first phase, or first appearance of destroyers within sight of the battleships, some destroyers maneuvered within short range of the battleships; with little smoke protection, and as much as 2 to 3 points on the bow of the battleships, they would have suffered badly during this period.

5. Thirty-two torpedoes were discharged by the flotilla. Two or three of the torpedoes launched by the leading destroyer division made excellent runs and caused the battleships to make changes of course to avoid them. One torpedo made a cold run and was practically stopped about 15 feet from the *Idaho*. *Idaho* at this time desired to change course to port to avoid torpedoes coming down on her port bow, but dared not do so for fear of throwing her stern into the torpedo lying close aboard.

6. Before the *Idaho* had completed her changes of course to avoid the torpedoes of the leading destroyer division, she sighted several torpedoes approaching from about 45° on the starboard bow, and several approaching from about 45° on the port bow. The paths of these torpedoes appeared to be about to intersect at a point almost dead ahead of the *Idaho*. *Idaho* was kept busy for some time, dodging these torpedoes. She was successful in doing so. There was no difficulty in sighting the torpedo wake. The torpedoes appeared to be an unusually long distance ahead of the visible wake. The advantages of higher speed torpedoes are apparent.

7. Both the *Idaho* and *Mississippi* avoided all torpedoes. However, this was at the expense of practically total loss of gun fire on the assumed enemy for a considerable period of time (record of time not available at present). Effective gunfire, under the constant changing of course, was impossible. The forward turrets of the *Idaho* were directed against the destroyers from about the time they executed "Divisions column right." Certainly some damage would have been inflicted upon the destroyers, but the volume of torpedo fire would not have been materially reduced. The changes of direction and speed of destroyers; the high rate of change of range as the destroyer approached the battleship; the protection of smoke screen, together with the small fire that battleships could bring to bear (ahead turret fire of leading ship) would prevent battleships inflicting any considerable damage to destroyers, at least before they had discharged their torpedoes. Battleships discovered that when turret fire was placed on an enemy abeam, none of their 5-inch battery would bear on an enemy ahead.

8. It is most important to appreciate that there were but two battleships in this target of the destroyers, and that a majority of the torpedoes crossed ahead of the *Idaho*. Had there been eight battleships in the formation, and had the point of aim been placed on the fourth or fifth ship, it would have been practically impossible for all ships to avoid the torpedoes without executing "ships right about," or a change approximating this. In any case a number of the ships, in an attack of this kind, must maneuver appreciably or take the damage.

9. A "wakeless" torpedo would be a wonderful asset to destroyers.

10. It is questionable whether destroyers should continue to maneuver within short range of battleships, away from smoke-screen protection, after they have delivered their principal torpedo fire.

11. This practice emphasized the value of an attack in which torpedoes approached both bows of the battleships practically simultaneously. It illustrated a point that was emphasized in British torpedo instructions, viz, that the general tendency is to deliver torpedoes in such a way that they pass ahead of the target. This would be corrected by placing the point of aim farther down the enemy column.

12. Though there were many excellent shots, there were also a number poorly aimed, several circular runs, and several cold shots, indicating the necessity of more careful preparation of torpedoes and perfecting of torpedo fire.

13. The fact that 31 of the 32 torpedoes fired were recovered, while the thirty-second was seen to sink, shows that there need be no hesitancy in drawing up rules for future practices through fear of losing valuable torpedoes.

14. The form of attack delivered on this occasion is an excellent one whether attacking from leeward or windward, and is not difficult of execution. One or two destroyers at the head of the column might be picked off during the approach, but the two rear divisions should be able to deliver an effective fire at close range. From the battleship point of view it emphasized very strongly the absolute necessity of a force of cruisers or destroyers ahead to break up the attack. Gunfire of the battleships can not break it up without making a radical change of course and taking "own" fire off the enemy battle line.

15. The battleships received regular reports from aircraft. This indicates necessity of working up interference with aircraft radio.

U. S. S. "Salem,"
San Diego, Calif.
10 July 1920.

From: Capt. L. R. Sargent, United States Navy.
To: Commander Destroyer Squadrons, Pacific Fleet.

Subject: Experimental Torpedo Practice.

1. Rules for "Experimental Torpedo Practice, Destroyers," were included in "Orders for Gunnery Exercises, 1919–20," chapter 35. The practice was conducted, however, in accordance with rules revised on the initiative of the commander destroyer squadrons, Pacific Fleet, and approved by the department. The principal points of difference between the original rules and the revised rules were that the latter—

(*a*) Imposed upon the target group (battleships) such restrictions as to maneuvering, etc., as would result from engagement, at the time of destroyer attack, with an enemy force of equal strength.

(*b*) Left discretionary such matters as composition of forces, speeds, point of attack, etc.

2. Practice on 12 June 1920, was preceded by dress rehearsal on 23 May. Several days of intensive tactical training preceded each event. Three battleships participated in dress rehearsal; two in practice. Eighteen destroyers composed the attacking force throughout, with occasional replacements.

3. Flotillas 5, 10, and 11 contributed to the make-up of the special flotilla (attacking force), which Capt. F. T. Evans, United States Navy, was designated to command. All destroyers were contributed that could be spared from other squadron activities. For the weeks ending May 22 and June 12, respectively, destroyers composing special flotilla were turned over to the control of commander special flotilla.

4. All tactical maneuvers were executed on whistle signals. Destroyers that had previously operated with Flotilla 5 were familiar with whistle system; others, in general, were not. It was recognized throughout the squadron that flag hoist signals could not be effectively employed for destroyer maneuvers of the contemplated character; but there was difference of opinion as to whether whistle signals or shapes were the preferable substitute.

5. Destroyers, as contributed by Flotillas 5, 10, and 11, were assigned to divisions, with special flotilla, according to their respective characteristics. Division commanders lacked that familiarity with the destroyers under their command, and particularly with the personal equation of commanding officers on which success and precision in maneuvers so largely depend. The same was true in the case of commanding officers relative to ther neighbors in formation, and to some extent in the case of flotilla commander relative to division commanders and commanding officers.

6. No feature connected with the practice is more illuminating than the improvement in maneuvering accomplished in a few days of intensive drill, using whistle signals. The results pay high tribute both to the skill of the special flotilla commander and to the soundness of his system.

7. Maneuvers were first conducted in column formation. Five special formations were progressively devised and tried out by flotilla commander, to cover various conditions of attack, from windward or leeward. Four of these formations (able, boy, dog, and easy) have survived the test to date, and are believed to possess permanent

value. Formations able and boy (right and left hand variations of the same formation) are designed for attack from windward; formation dog and easy for attack from leeward. Formation cast was also designed for attack from leeward; but was condemned by originator and all observers, I believe, for the reason that it draws fire upon an exposed point in the formation approximately fixed in bearing and distance. Description and discussion of the several special formations is contained in memorandum issued to commanding officers by special flotilla commander, about 9 June. Diagrams of all formations were also prepared by special flotilla commander; and the several forms of attack were placed on the game board at War College sessions, (Coronado), with all commanding officers present, to the substantial benefit of all concerned.

8. At dress rehearsal, 22 May, one attack was made in column formation, and one in formation boy; both attacks being from windward. Battleships reported that column attack presented the more effective appearance. Comparison in that instance is lacking in value, however, for the reason that formation boy attack was marred by an untoward incident and was not up to standard.

9. At experimental torpedo practice, 12 June, attack was made, with conspicuous success, in formation easy. Light variable airs were setting toward the battleships at the moment of attack. The movement of the smoke screen was, however, inappreciable in comparison with the speed of destroyers, and the situation consequently called for a formation appropriate for attack from leeward.

10. The smooth coordination of all elements in the conduct of the practice was a well-earned consummation of vigorous and intelligent preparation under adverse conditions. The preeminently important result, however, is the demonstration of the effectiveness of well-handled destroyer attack, by daylight, under smoke screen, against an engaged enemy.

11. There is apparently no limit to the potentialities of smoke-screen attack. Properly developed, it is believed that, in strength such as should be available with any United States fleet, it has the power to reverse to our advantage almost any conceivable battle situation.

12. Similarly without limit is the amount of study, experiment, and practice merited by the subject. Under every combination of circumstances, the destroyer commander must be able to lay his screen with accuracy approximating the absolute in the elements of both space and time relative both to the enemy and his own main body.

13. In the recent practice the "Seaman's eye" was effective in a measure not less than remarkable. It will always, in such maneuvers,

be an asset of peculiar value. With practice, distances can be gauged by eye to an approximation sufficiently close for the purpose of torpedo firing, and the eye must be depended upon until radical advance is made in the art of range finding or until a satisfactory type of destroyer leader is provided. Tactical instruments for use throughout the approach, and particularly in its early stages, would, however, be of great assistance to the destroyer commander of whatever type, and indispensable to those not gifted by Providence with an exceptional "Seaman's eye." The "Burrage course and distance finder" is believed to be excellently adaptable to the purpose, and inquiry has already been made with a view to securing an instrument for tryout.

14. Practice in destroyer smoke screen attack should always be made against a material target, if only a single destroyer, simulating the enemy force. Preferably your own main body should also be materially simulated, in order that there shall always be kept in view the necessity of preventing smoke screen from interfering with the latter while so laying it as to effect your purpose against the enemy.

15. In the practice on 12 June battleships were threatened by numerous torpedoes, but were able to avoid them by use of rudder. It is recognized that the situation would have been somewhat altered had there been a squadron of battleships instead of only two in column; also, that such use of rudder fire would be detrimental to the enemy. There is, however, a vast difference between results attained, on the one hand, by causing a genuflexion in the enemy column, and, on the other hand, by exploding torpedoes against his ships. The point at issue has a bearing on the doctrine of the "closed target." Torpedoes fired at a column as a "closed target" will approach from ahead; and, if seen at a reasonable distance, can be avoided with slight rudder. What bearing this circumstance has upon the final merit of the "attack from ahead" in general and of the "closed target" in particular is perhaps open to discussion.

16. Recent developments in torpedo design have a bearing in the premises. Bureau of Ordnance letter of 4 December 1919, states that devices for the reduction of smoke and wake have been incorporated in mark 8, modification 4, 5, and 5a torpedoes. Devices are reported successful on test, "Practically eliminating all smoke, and reducing wake to such an extent that visibility beyond 500 yards is negligible." Such improvement in our present weapon would relieve the doctrine of "attack from ahead" and of the "closed target" from the criticism outlined in the foregoing.

San Diego, Calif.
14 July 1920.

From: Lieut. Commander W. L. Moore, United States Navy.
To: Commander Destroyer Squadrons, United States Pacific Fleet.

Subject: Experimental Torpedo Practice.

1. In this attack torpedoes were fired from dead ahead and from both bows nearly simultaneously. These positions gave the advantage that the enemy column presented a closed target to the torpedoes. The fact that there were only two ships in column rendered the advantage from the value of the "closed target" idea less apparent.

2. It may be contended from the fact that the two battleships were successful in dodging all the torpedoes fired at them that the position chosen for firing at them was wrong, and that a firing position farther on the bow would have made evasion more difficult as well as increased the size of the target.

3. To this it may be advanced: Had the torpedoes been fired from broad on the bow the kite balloons would undoubtedly have given the battleships warning of the approach of the torpedoes in ample time for them to turn their bows toward the torpedoes. The ease of evading torpedoes would then have been the same for individual ships; there would have been open water between ships in the target amounting to about 470/100, or 94 per cent, of the target presented by the fleet, through which open water many torpedoes would have passed without imposing on the battleships the necessity for dodging; the gunfire of the battleships could not have been much more seriously disrupted by such a maneuver than it was by the rapid maneuvering they were compelled to execute in this practice.

4. The small target presented to an attack from ahead, made by divisions on both bows, firing nearly simultaneously, resulted in torpedoes from different divisions reaching the target on converging courses, making the task of the battleships in evading them more difficult.

5. An extension of this idea which suggests itself is, that were this convergence of torpedoes much increased the chances of success in obtaining hits would be greater. For example, had the first salvo been fired from well on the starboard bow of the battleships, the latter would have been compelled to turn radically to starboard to meet them. The salvos from the other two divisions, if fired from a few degrees to port of the battleships' line of bearing, would have found them presenting a wide closed target, and the ships on courses from which it would have been very difficult for them to turn to meet the new salvo of torpedoes. Such an attack requires close cooperation, but it could be easily made by a slight modification of the scheme used in this attack.

6. It should be noted in connection with all forms of attack from ahead that the target fleet in column can only avoid presenting a closed target by changing course in column. A simultaneous change results in increasing the size of the closed target. When the attack is made from any other position, a simultaneous change in course toward the torpedoes will make the target more open.

7. One point in connection with the attack from ahead which is believed worthy of especial note is the extremely short time (16 minutes) which elapsed from the starting of the smoke screen at 20,000 yards until the arrival of the torpedoes among the battleships. The destroyers made less speed than they would probably employ in battle. It is difficult for one who has not engaged in such an attack to conceive the speed with which the opposing forces come together. Calculations and game-board work do not give the mind the grasp of the element of time which actual attacks do. It is submitted that destroyer attacks from ahead should form part of the regular training for war of the battleship force. The battle-fleet commander who does not realize, from experience, that a destroyer force on the horizon ahead is an imminent instead of a remote menace will surely be at a disadvantage in battle.

[First indorsement.]

San Diego, Calif.
16 July 1920.

From: Commander Destroyer Squadrons, United States Pacific Fleet.
To: Commander in Chief, United States Pacific Fleet.

Subject: Experimental Torpedo Practice.

Inclosures: (1) Comment of Capt. L. R. Sargent, United States, Navy, commander flotilla 11.
(2) Comment of Capt. F. D. Berrien, United States Navy, chief of staff to squadrons commander.
(3) Comment of Commander I. H. Mayfield, squadrons gunnery officer.
(4) Comment of Lieut. Commander W. L. Moore, United States Navy, squadrons engineer officer.

1. Forwarded.

2. Attention is invited to inclosures. The squadrons commander concurs in the comments and recommendations given therein.

3. The formations and methods of attack used in this practice and in preparations and rehearsals therefor are in the nature of doctrine and are considered strictly confidential. A separate report on them is being prepared and will be forwarded as soon as completed. It

will be in the nature of a recommendation on "Tactics and Doctrine for Daylight Destroyer Attack."

4. The "Orders for Gunnery Exercises, 1920–21," have just been received and the squadrons commander takes this opportunity to comment on the rules for experimental torpedo practice as laid down in Chapter XXV. In the opinion of the squadrons commander and all experienced officers of the destroyer squadrons, the experimental torpedo practice on which these papers are a report is the most valuable and instructive practice of this kind that has ever been held by the United States Navy. Even if it taught no other lesson, it demonstrated beyond all doubt that it is possible to fire a large number of torpedoes at battleships in the open sea without danger of losing many of the torpedoes. This same form of practice should be held at least once each year under rules that more and more closely simulate actual battle conditions. This is the only way in which destroyers can prove the fallacy or soundness of their methods of attack and of firing torpedoes. It is the only way in which battleships can gain experience in coping with such an attack which would surely be delivered by any enemy that possessed the destroyers. The rules as laid down for 1920–21 are a distinct "step backward." It is strongly recommended that permission be requested to hold a practice similar to the one held on 12 June in place of or in addition to the one prescribed for 1920–21.

5. This practice gave an excellent opportunity for observing the advantages of an "attack from ahead." The attack from ahead is easier of execution, with chances of success, than is an attack from any other position. Different experts have submitted long papers, with numerous figures, to prove that the best position is $3\frac{1}{2}$ points, or some other number of points on the bow of the target. The fact remains that many factors enter in battle to make it difficult to place the attacking vessels on that certain bearing and at a certain range at just the proper stage of the battle. Even though the ideal position be gained there are many more factors to interfere with the accuracy of fire, and to nullify even the accurate fire. Enemy cruisers and destroyers will be met; aircraft will be busy overhead; secondary batteries of battleships will be used when they bear; damaged vessels will be found in the way; interference of smoke and own destroyers can not always be avoided, and all the errors of torpedoes and torpedo control, together with the ability of enemy battleships to maneuver independently to avoid torpedoes, make the delivery of an attack, by an approach from any other direction than ahead, very difficult of successful execution.

6. In the attack from ahead a flotilla of destroyers can drive straight toward the enemy in column formation without difficulty

until within about 20,000 yards, outside of effective gunfire. At this point their smoke covers all but the leader. As they are closing the enemy at a high rate, their own speed (about 25 knots) plus enemy speed (about 20 knots), they advance a very short interval of time and form column of division guides, or some variation of same. This can be done with practically no signaling, by employing doctrine. The leading division will probably be exposed to fire for a short period of time before discharging torpedoes. The second and third divisions, however, benefit from the smoke, and approach unseen to a very close range before discharging the torpedoes, and are in a position, by executing "ships right" and "ships left," respectively, to deliver their torpedoes in such a way that torpedoes approach the enemy from both bows practically simultaneously, making it almost impossible for the enemy to avoid them. Or they may fire on the "closed target."

7. The attack from ahead is easy of execution; reduces the time of attack; permits firing at the "closed target"; permits delivery of torpedoes on both bows of enemy battle line; subjects attacking destroyers to least gunfire, and offers an easy "get-away" after the attack. It is strongly recommended that in drawing up the proposed Manual on Torpedo Fire, this attack from ahead be given serious consideration.

[Second indorsement.]

United States Pacific Fleet,
U. S. S. "New Mexico" (Flagship),
Passage San Francisco, Calif.,
To Honolulu, T. H.,
7 September 1920.

From: Commander in Chief, Pacific Fleet.
To: The Chief of Naval Operations (Gunnery Exercises and Engineering Performances).

Subject: Experimental Torpedo Practice.

1. Forwarded for information of the department.

2. The recommendations of the commander, destroyer squadrons, Pacific Fleet, are, in general, concurred in by the commander in chief. The practice conducted on 12 June 1920, was of the greatest value to all concerned. Exercises of this nature on a large scale are considered essential to the development of the tactics and doctrine of the several forces and of the Fleet as a whole.

3. The *Idaho* and *Mississippi*, comprising the target division (*Idaho* leading) were, at the beginning of the attack, in a 10° line of bearing on port quarter of leader so that the *Mississippi* could

have a full view of the attack and of approaching torpedoes and so that both ships would be free to change course within the prescribed limits of 30° on either side of base course, to avoid torpedoes.

4. Both ships, changing course independently, were easily able to avoid torpedoes by use of the helm, and at no time was it necessary to make use of the full 30° change of course, as allowed by the instructions for the exercise.

5. In executing the independent movements above noted, no embarrassment in the fire control of the main battery was experienced (this can not, however, be considered conclusive in view of the absence of a material target and of actual firing with consequent fall of shot to be controlled), and no undue separation of the two units or difficulty in maintaining approximate position in formation resulted; it is believed that the same latitude of movement could be allowed and carried out in a division of four ships, but the practicability of such freedom of movement of the units of a fleet would no doubt be limited by the general disposition and by the proximity and bearing relative to the line of fire of main battery of other units.

6. The commander in chief is in doubt as to the advantages claimed for a closed target in the attack from ahead, for correlative with this condition is the greater ease with which torpedoes approaching from ahead can be avoided by a slight change of course toward the torpedoes, whereas when torpedoes are sighted off the bow or beam it is most difficult to determine whether a change toward or a change away or even a change of speed will be the best in the attempt to avoid torpedoes. In the attack from ahead the advantage of the relatively great length of the modern battleship is minimized, it being greatly foreshortened by the very small angle on the bow and the target width is augmented only by the beam of the units and their number in the formation, whereas the greater the angle on the bow the more nearly the full length of the ship enters into the target area. The advantage to be obtained by the combined speeds is admitted, but the greater ease in attaining the position ahead as compared to attaining a position on the bow is not apparent.

7. No minimum limits of approach at which destroyers were to be considered sunk or out of action were set or were noted during the exercises, but it is important to note that with forward turrets engaged abeam a portion of the forward 5-inch battery is blanked and only a small portion remains, with clear arcs of fire, available for use in repelling attacks from ahead. It is therefore considered necessary under such conditions of attack that the leading ship in fleet, squadron, or division columns divert the forward turrets from the main enemy action to assist in repelling or diverting the attacking destroyers. This procedure should be embodied in standard doctrine for control of fire.

8. It is recommended that these papers, when they have served their purpose at the Navy Department, be forwarded for information and study at the Naval War College.

[Fourth indorsement.]

12 October 1920.

From: Bureau of Ordnance.
To: Chief of Naval Operations.
Subject: Experimental Torpedo Practice, Pacific Fleet.
Reference: (*a*) Letter (herewith) from Comdr. Special Destroyer Flotilla to Comdesron, Pacific, File 871–SF–A of 14 June 1920.
(*b*) 1st end. on (*a*) by Comdesron, Pacific, File 5242–F–2/2 of 16 July 1920.
(*c*) 2d end. on (*a*) by C–in–C, Pacific, File 9560 of 7 September 1920.
Inclosure: (A) Letters forwarded with reference (*a*) (herewith).

1. The practice appears to have created a marked battle viewpoint which is noticeable in all the reports. It is considered that the acquisition of a true battle viewpoint is essential to the correct development of all naval material. However, it is believed that a somewhat incomplete viewpoint, therefore, perhaps a faulty one, must have resulted in this particular case because the practice was incomplete as a battle maneuver in the following major particulars:

(*a*) The opposing battle fleets were not represented.
(*b*) Opposing light forces did not come into conflict.
(*c*) The target formation did not contain enough vessels.
(*d*) Gun fire (blanks) was not employed.

2. *Representation of opposing battle fleets*, with attendant light forces, together with a regular battle approach, is necessary to ensure a development of the action in which the *time element* will have a normal value. The time element is a major determinant of the character of destroyer attack as regards firing position and tactical value. There also will be obtained data on the interesting question of the practicability of the use of a smoke screen to cover an offensive destroyer attack without thereby interfering with gun fire of own fleet.

3. *Presence of opposing light forces* almost certainly will result in close range encounters which inevitably will exert a determining influence on firing position and method of attack. In addition the countering light forces themselves probably will contemplate a torpedo attack on our fleet, to meet which our own light forces must take appropriate action. It is highly probable that the inclusion of all these elements will modify materially existing theories on destroyer attacks.

4. *The target formation* should consist of a large fleet of capital ships, if possible not fewer than eight. Only a large formation will present in full measure to the attacking force the important problem of *spread distribution*, and only with many ships in formation will the maneuvers necessary to avoid torpedoes assume their most serious aspect. These maneuvers will have two forms: (*a*) Early maneuvers by the formation as a whole to avoid the entire discharge of torpedoes, and (*b*) maneuvers by individual ships to avoid torpedoes sighted close aboard. Only the presence of a considerable number of ships in the target formation will permit reaching correct conclusions also relative to the following important questions which bear upon firing position and formation for the attacking vessels:

Should torpedoes reach the entire target line simultaneously, or should they arrive consecutively?

Gun fire against destroyers attacking from various directions.

Effect of maneuvers to avoid torpedoes on major gunfire at opposing fleet.

Effect on major gunfire of opposing fleet caused by these maneuvers.

Possibility of discounting attacking destroyers for a long period of time, if too far on the bow, by going ships about.

5. Fullest possible simulation on attacking vessels of battle conditions is essential to avoid getting false ideas relative to practicable control and signaling methods. For example, is whistle signaling practicable during local gunfire? Coordination of ship control with the various elements of fire control under simultaneous use also will be necessitated. These matters vitally affect the design of control equipment.

6. In general, it is felt by the bureau that the form of experimental attack carried out in the Pacific Fleet was so fragmentary in nature that many false battle conditions must have developed without detection. It is noted in the remarks of Lieut. Commander W. L. Moore that until an officer actually has witnessed an attack from ahead he can not have a true conception of the velocity with which it is consummated. To the bureau this suggests the remark that until a battle maneuver is held which is complete in every respect, torpedo fire being only one element, few officers will be able to form correct conceptions of probable battle conditions. Under present conditions there evidently exist several widely divergent opinions thereon, together with differing theories of the best form for long and moderate range destroyer attacks. It hardly is probable that academic discussions will clear up these theories, and, therefore, it is urged earnestly that several battle maneuvers on a large scale be held as soon as possible, torpedo fire being only one element.

7. With reference to the development of a smokeless and wakeless torpedo, trials to date indicate that smoke can be eliminated and the wake can be reduced considerably. Timing of experimental torpedoes on the range has proved difficult, though it is not known to what extent they would be visible from the tops of ships or from aircraft. It may be assumed reasonably that the improved torpedo will be much more difficult to detect than are the torpedoes now in service, particularly under battle conditions of observation.

8. Further detailed comments have not been attempted because of the incomplete evidence afforded by the practice which will not permit reaching conclusions on tactics or control methods without fear of accepting false premises unknowingly. However, the bureau feels that the energy and initiative displayed in the conduct of the practice should receive warm approval.

9. Reference to the Torpedo Tactics Board, now in session, is recommended.

REPORTS ON AIRCRAFT PROBLEMS NOS. 9 AND 11.

Source: Commander Air Force, Atlantic Fleet.

23 October 1920.

From: Commander Air Force.
To: Commander in Chief.
Subject: Report on Aircraft Problem No. 9.

1. The execution of problem 9 on 13 October, though not in accordance with the prearranged plan, was of sufficient value to draw certain conclusions in regard to the use of smoke bombs and torpedo plane tactics.

2. It had been planned to send the two *NC's* to lay a smoke screen through which the six *F–5–L's* and the four *R–6's* of the torpedo plane division were to attack the battleships at anchor at rendezvous Z. Unfortunately most of the battleships were absent; and as the *R–6's* had been assigned to other duty, they could not take part. A simple doctrine had been developed for the problem and was tried out.

3. The *NC's* dropped four smoke bombs at intervals of 250 yards about 1,000 yards to the windward of the *Nevada*, the only battleship at the rendezvous, from an altitude of 1,000 feet. One section of three *F–5–L's* attacked from a position beyond gun range and about 1,000 feet altitude, simulating a torpedo plane attack, driving to surface behind smoke screen and approaching target at about 15 feet altitude at full speed through smoke.

4. Later, *NC 7* dropped four smoke bombs to windward of *Utah*, about 10 miles distance from the *Nevada*, and a simulated torpedo plane attack was made by one of the *F–5–L's*. The chief of staff on

the *Utah* stated that the smoke screen was very effective; that it completely enveloped the ship, so that while the engines of the attacking airboat could be distinctly heard, she was not seen until she came through the screen, with little chance for the antiaircraft gunners to get on the target.

5. The four smoke bombs dropped by the *NC 8* emitted smoke, but one was of very limited output. Two of the four bombs dropped by the *NC 7* gave off a thick, white smoke, and two made none; reason not known.

6. The airboat division commander reported that "Bombs give off a thick, white smoke, which serves as a most effective screen. When passing through this smoke at an altitude of 15 feet the water directly beneath was completely obscured. When approaching the smoke and while passing through it and when viewed from above, the smoke has the appearance and consistency of a heavy, sharply defined cloud of steam. When passing into the smoke everything is completely blotted out, and when passing out of the smoke objects ahead fairly jump into view without a fraction of a second's warning. It is not believed that it will be possible to make an efficient attack on a vessel actually enveloped in smoke from this type bomb—first, for the reason that there would be no object upon which to sight; and, second, for the reason that there would be the greatest danger of collision with the ships attacked."

7. Smoke bombs should be improved in the following particulars:

(*a*) A greater dependability in emitting smoke. About 50 per cent of those dropped have made no smoke. Bombs of present design must be dropped at an altitude of less than 1,000 feet in order for the bombs to function. They should be so constructed as to permit dropping from altitudes that will enable airboats to be out of danger from antiaircraft fire—say, 5,000 feet.

(*b*) Our experience with laying smoke screens is at present too limited to specifically state what is the best practice in regard to laying the screen, whether it should be to windward or to leeward, etc. Its distance and position with respect to target depends upon several factors—such as direction and strength of wind, and speed, course, and formation of fleet.

(*c*) Enveloping the target with smoke prevents the target from seeing the attacking air boat, but also prevents the latter from seeing the target and introduces an unnecessary element of danger. It is therefore believed that there should be a clear space between the smoke screens and target. This can be assured by laying the screen to leeward of target. The chances are that in war the fleet would not be caught at anchor, and therefore smoke-screen tactics should be practiced with the fleet under way.

(*d*) The number of smoke bombs carried—four—is insufficient to lay a proper screen. This suggests the advisability of supplying all air boats and torpedo planes with smoke bombs, so that a more effective screen may be laid before the attack; it also has an advantage to have all boats equipped so that they may be utilized to make a screen when circumstances are favorable, without requiring the services of any special designated smoke layers. From our limited experience with smoke bombs it is believed that they should be dropped at intervals of about 100 yards, and in a direction of about one point from the wind on either or both bows of target. The screen should be placed so as to present a solid wall through which the planes will attack, allowing sufficient clearness between the screen and target to permit them to point the torpedoes and turn before arriving at target.

8. A doctrine is being developed gradually, but it will require many practices to establish one that completely covers the many situations likely to arise in action. Each practice will bring out something new to incorporate in the doctrine, and each should therefore be an improvement on the preceding one. A doctrine for the air force is even more important than one for surface craft, because of the greater difficulty of communicating between aircraft and because their great speed emphasizes the importance of the time element in making decisions.

For instance, the plan of action prepared for problem 9 contemplated that all battleships would be at the rendezvous. Only one battleship was there, and another one was later found at rendezvous "Y." The unexpected absence of battleships created some uncertainty on the part of some units of the air force as to what to do, thinking perhaps the attack would not take place. This upset the prearranged plan. Poor visibility and failure of the communication service prevented the senior officer from exercising effective control over the whole force, that had become scattered. This illustrated the necessity for indoctrination under circumstances where element of surprise entered. The operations were finally carried out against one battleship at Z, and subsequently against one at Y, but with only part of the air force present and with unnecessary delay.

9. It has been found necessary to modify the doctrine so that control over the entire force will not be lost by the separation of smoke layers from the attacking air boats before sighting enemy. To preclude possibility of doubt as to who is responsible for the initiative in directing the attack, the senior present will either lead the smokers or will delegate to them the authority necessary when and where to initiate the attack.

24 October 1920.

From: Commander Air Force, Atlantic Fleet.
To: Commander in Chief.
Subject: Aircraft Problem No. 11, report.

1. Battle Squadron 3 left the southern drill grounds at 4 p. m. 15 October 1920, for New York. The problem assigned to the air force, then at Hampton Roads, was to search for the battle squadron to determine how far they could be seen and how far radio communications could be established. The Rockaway air force was assigned the same problem.

2. The air boats left Hampton Roads by sections at half-hour intervals after daylight of the 16th. Weather conditions ideal, except for fog. Visibility on surface during forenoon of 16th less than 1½ miles, at higher altitudes visibility increased to about 4 miles; but the battleships were not sighted until near the narrows.

3. To get accurate data concerning radio all boats of this force were directed to record all signals heard, and to maintain silence except for necessary tactical work. The first two boats to take off had orders to call Combatron 3 alternately at 15 minutes intervals until answered, and each boat was to broadcast the word "Contact" if it sighted the fleet.

4. *Nos. 3670* and *3799* took off at 0624 and proceeded in company along coast to Atlantic City, thence about 20 miles off shore until east of Ambrose Channel Light Vessel forming scouting line 90°, interval 5 miles, and swept this area till 1105, anchoring in North River at 1130 without having seen the fleet, owing to low visibility. Radio communication was established with Combatron 3, 0815, airboat *3799* at the moment being 1 mile north of Fenwick Island. Estimated distance from *Utah* 95 miles. The *Shawmut*, which was ahead of the battleships, heard *3799* calling Combatron 3 at 0640 at a distance of about 195 miles from this air boat.

5. It is not known whether *Utah* heard *3799* calling before 0815. It is possible that *Utah* answered before this time; but if she did so neither the air boat nor the *Shawmut* heard her. The test proved that the air boat could be heard 195 miles and that she heard *Utah* 95 miles.

6. *Nos. 3659* and *3799* took off at 0735, proceeded in company to Atlantic City, then took course 40° in scouting formation, interval 7 miles, until abreast of Sandy Hook, then made landfall at north end of Sandy Hook without having sighted fleet. *No. 3659* intercepted signals from Batron 3 at distance up to 90 miles. There was much interference caused by air boats from Rockaway air stations.

7. *NC 7* got off at 1015 and picked up battleships off the entrance to New York. Owing to fog she flew low and reeled in trailing

antenna. Off Cape May a bird carried away her skid antenna. She got no communications.

8. *NC 8* got off at 1045. She had a leaky radiator, and had to land three times. She arrived in New York at 1655, after the fleet got in.

9. *Nos. 3681* and *3693* on account of engine troubles did not get away from Hampton Roads till the following day, after replacing the old engines with new ones at Hampton Roads air station.

10. Of the eight boats of this force only two were punctual in getting off on time. The N. C. division could not get off in the calm, and had to lighten the load by getting rid of some fuel and part of the crew. It is believed that a fourth motor will have to be added to these boats to make them efficient. At present they are not as dependable as the *F–5 L's*. *No. 3695* broke her starting gear and had to get a new one at Hampton Roads before she was able to leave; *No. 3789* could not take off with her load, due to overheating of her old engines, and had to lighten ship.

11. The engine troubles mentioned above are not new, nor were they unexpected. Frequent detailed reports have been made previously relative to the condition of power plants on all air boats of the squadron. Steps are now being taken to correct these difficulties, and it is hoped that by the end of this month all air boats will be in efficient condition to carry on any form of exercise required of them, with a reasonable assurance of reliable operations.

12. Attached is a communication log of this force for the information of the commander in chief. A study of it will show that it is absolutely necessary to regulate the procedure, and it is respectfully recommended that a conference of the commanding officers of Rockaway, the air force, and fleet radio officer be held at an early date to discuss the question of radio control for future operations of the air forces. At present the operation of radio by air craft is seriously inefficient. This is shown by the fact that between 0607 and until 0743 there was a continuous flow of radio communication among the units of the Rockaway force and intermittently thereafter till 1030. No less than 53 of these calls were recorded in *Shawmut's* radio room from *C–7–L*, *33 B*, *33 C*, or *33 D* between 0607 and 0743, the greater portion of which were unnecessary.

A. W. Johnson.

MISCELLANEOUS.

COMBAT FIRING OF THE FIRST INFANTRY, FIRST DIVISION, JAPANESE.

Source: Reliable.

(9952.)

30 September 1920.

The First Infantry is stationed in Tokyo, but goes to Yotsukaido, about 25 miles distant, for combat firing. The ground is also known as Shimoshizu; there is a Field Artillery School of Fire and a branch aeroplane school there also. Due to this fact, the ground available for Infantry combat firing is somewhat restricted

The combat firing witnessed differed in no material respect from that seen eight years ago. The procedure may be briefly summarized as follows:

The company being assembled under cover, the company officers reconnoiter to the front and discover the target, in this case a line of standing figure targets. The company is then deployed in skirmish line and moves forward and occupies the line designated by the company officers, one section held back in reserve. Fire is opened immediately and continues until the targets disappear; the line then moves forward until the targets again appear, when it halts and opens fire. At the second halt the reserve was deployed and moved up on the flank of the line. Here a new target consisting of a machine-gun section appeared; the company commander designated a section to fire on the new target.

The company commander with one noncommissioned officer was about 50 yards in rear of the skirmish line, the lieutenants about 25 yard sin rear of their platoons. All control was exercised by the voice, no whistles or signals being used. Everything connected with the exercise was according to prewar standards.

The battalion commander was the chief umpire, and after the exercise, assembled the officers and noncommissioned officers of the company and gave his critique. All field officers of the regiment attended the exercise; the regimental commander also delivered a critique embodying his observations on the conduct of the problem. The probable number of hits had been determined in advance—in this case the actual hits were slightly in excess of the number figured as probable.

The exercise was carried out rather perfunctorily, due perhaps to the fact that the new regulations will doubtlessly change the system before next year. Appendix A shows an outline of the exercise.

Machine-gun firing.—The regimental machine-gun company also held what is known as "applied firing" on the same day, as the Infantry combat firing. This company is said to be an unusually well-drilled organization. It is armed with six model 1914 machine guns.

Targets.—Three groups of prone figures at one meter interval, each group 30 meters long, each group fired on by one gun.

Rate of fire.—Ninety shots were to be fired in 20 seconds. Due to minor malfunctions, however, this rate was not maintained. Each gun was carried by four men; from the time it was placed on the ground until the first shot was fired was in no case less than 1 minute 20 seconds. The target was well defined.

Range.—Three hundred meters.

Result of fire.—Thirty prone targets in each group, 90 shots fired at each group. Expected hits, 12 in each group.

Actual hits.	First group.	Second group.	Third group.
Direct	5	11	8
Ricochet	4	0	3
Targets hit	7	9	10

NOTE.—All machine-gun firing is at 600 meters or less. There is no direct firing in the regimental machine-gun company.

The regimental telephone detachment consists of 1 officer and about 30 men, detailed from the various companies of the regiment. The best men available are chosen for this detail and remain on this duty during their entire service. This detachment is charged with connecting regimental headquarters with battalion and brigade headquarters. The division connects its headquarters with brigade headquarters.

The First Regiment has had one 37 mm. gun and one 3-inch trench mortar for experimental purposes.

The First Regiment Infantry has 1 colonel, 2 lieutenant colonels, and 6 majors. It will be noted that there is 1 lieutenant colonel and 3 majors in excess, a condition quite general throughout the Army.

APPENDIX "A."

8 September 1920.

At Shimoshisuhara.

SCHEME FOR COMPANY BATTLE FIRING (A).

Commander in charge: Maj. Okuyama.

Object of maneuvers and organization of unit: Attack.

Chief object in training: Firing at low targets at medium range. Distribution of fire of machine guns.

Number of the unit: The Eighth Company.

Commander of the company: Capt. Nagashima.

Commanders of the section.	Squad leaders.	Men.	Sergeant major.	Trumpeter.	Ammunition carried.	Total.	Ammunition to be used.	Total.
Kohara	2	18	.....	.....	40	.....	37	.....
Kusuno	2	18	1	3	40	2,120	37	1,927
Hishiumi	2	18	.....	.....	40	.....	37	.....

Assembly: Hour, 10 a. m. Place, northeast side of Dainichisan. Form, in company column.

Rules for Maneuvers.

1. The enemy will be represented by targets.

2. Each man supposed to carry regular amount of ammunition and should use what he carries as his first ammunition. When all gone men will carry on snapping of the trigger.

3. All reports to be made to the commander of the battalion and all information to be made to the neighboring company commanders should be made to the chief umpire of the maneuvers.

4. Shots should be distributed to each target.

Condition of the Battle.

1. The Second Battalion has deployed from the northeastern end of Dainichisan to the north side of Kobukadai against the enemy, which is occupying a position extending from a height west side of Hachogorin to the south end of the forest at Kobuka.

2. The Eighth Company, which is on the first line of the above battalion, is at the present position at 10 a. m.

3. The condition of the enemy is as what you witness.

Order of firing	First.		Second.		Third.	
Target:						
Number	Second target.	Second target.	Third target.	First target.	Fourth target.	Fifth target.
Space or width	0.95	0.95	.....	0.95	0.95	
Kind	Kneeling, skirmisher.	Kneeling, skirmisher.	Kneeling, machine-gun detachment.	Standing, skirmisher.	Lying down, skirmisher.	Lying down, machine-gun detachment.
Number	60	60	2	60	80	2.
Kind of material.	Raising and lowering.	Raising and lowering.	Raising and lowering.	Raising, lowering.	Raising, lowering.	Raising, lowering.
Motion: Electricity.						
Mark: Flag	Red and white.	Red and white.	Indigo	White	Yellow	Black.
Firing premeditated and result:						
Number of unit firing.	1, 2	1, 2	3	.....	2, 3	1.
Number of rifles.	36	36	17	.....	35	18.
Distance	780	780	780	790	600	600.
Back sight used.	800	800	800	.....	600	600.
Kind and speed of firing.	Individual firing 2.	Individual firing 2.	Individual firing 2.	.....	Individual firing 2.	Individual firing 2.
Firing time, minutes.	1	5	5	.....	12.30	12.30.
Number of shots.	72	360	170	.....	875	450.
Percentage of average hits.	11.8	11.8	17	.....	8.4	14.5.
Number of hits expected.	90	43	29	.....	74	65.
Expected number of target hits.	9	31	2	.....	48	2.

Object of Setting Targets, the Purport as Well as the Direction of the March, and the Progress of the Maneuvers.

In order to simulate an enemy occupying a position the second target will be shown. In order to mark the appearance of the machine guns in a position the third target is shown, and then to indicate the increase of the skirmishers the first target is displayed. With the same object above stated in view, the fourth and fifth targets are shown.

The company commander, while he was advancing with his two sections in extended order, found the effect of the enemy's fire too strong and ordered his men to halt and fire.

When it is found that our fire is too weak, skirmishers are increased. At this moment the enemy's machine gun appears, so the distribution of fire is ordered and the number of skirmishers increased.

No target is changed even when a reenforcement appeared in the rear of the enemy's skirmish line.

The fire power of the enemy became somewhat weak; we advanced with the advance of the left army.

Stop and fire.

APPENDIX "B."

SCHEME FOR APPLIED FIRING.

September 9.

At Ropponohara. Officer in charge: Capt. Yoshiii.

Important matters for this exercise:

Machine-gun commander—

1. Selection of firing position.
2. Observation of impact, and correction of laying.

Gunners—

1. Setting of a machine gun for a target.
2. Rapidity and certainty of laying.
3. Inspection and correction of laying.
4. Rapidity of sweeping fire.

Target.

Number.	Kind, number of men, and intervals.	Kind of material.	Distance.
First target.....	Prone; 35 men; 0.95 minute.....	Stationary.....	300
Second target....	Prone; 35 men; 0.95 minute.....	.....do.....	300

The essential points of the instruction:

Condition of Battle.

While our infantry are engaging with the enemy at the crest line machine guns will fire at the enemy at once from this position.

1. The movements will be started simultaneously by giving orders to the three commanders of the machine guns, inviting them to the prearranged firing position.

2. The firing is carried out calling the chief gunners' attention to the matters necessary for the maneuvers during their firing.

3. The rest is carried out by changing the chief gunners by turns.

Ammunition:	
Numbers carried	90
Numbers to be expended	90
1. The rapidity of the sweeping fire, go and return; seconds	20
2. Expected hits	12
3. Expected number of target hits	10
4. Percentage of hits	13.2

SURRENDERED FLEETS—FATE OF THE ENEMY WARSHIPS—DELIVERY COMPLETED.

Source: London Times, 12 October 1920.

"The final act of the great surrender drama by the German and Austrian Navies has now taken place. All the vessels which the beaten powers have been forced to give up to the victors are now delivered, and their allocation to the respective nations, allies, and associates has been determined. Most of the vessels have been or are being broken up, but others have been reborn and with new names incorporated in the fleets of their new owners. There they will doubtless do good service, and certainly fulfill a better purpose than that for which they were originally intended. When the ex-Kaiser on 9 November 1918, exclaimed with bitter emotion to Admiral Reinhold Scheer, 'I have no longer a navy,' it may be doubted if he either expected or was apprehensive of the painful circumstances in which his pet service would meet its disastrous and contemptible end.

"We are now able to give complete lists of the German and Austrian ships which have been surrendered (excluding the vessels sunk at Scapa and not salved and the submarines, of which lists have been already published), with their distribution among the various powers and method of disposal. On 21 June 1919, 10 battleships, 5 battle cruisers, 5 light cruisers, and 28 destroyers of the interned German ships were sunk at Scapa, but the cruisers *Nurnberg*, *Emden*, and *Frankfurt*, with several of the destroyers, were salved, and these will be found in the following lists. The German ships which have now been disposed of comprise 9 battleships, 16 light cruisers, 2 destroyer leaders, 59 destroyers, 50 torpedo boats, and 1 auxiliary. These vessels have been thus distributed, those which have been or are being broken up being indicated by the letters BR, in brackets, and those which have been incorporated in their owners' fleets by (IN.):

"*The battleships.*—To Great Britain, 5: *Baden* (BR.), *Heligoland* (BR.), *Posen* (BR.), *Rheinland* (BR. in Holland), and *Westfalen* (BR.). To Japan, 2: *Oldenburg* (BR. in Holland) and *Nassau* (BR. in the United Kingdom). To France, 1: *Thuringen* (BR. at Brest). To the United States, 1: *Ostfriesland* (BR. in New York).

"*The light cruisers.*—To Great Britain, 6: *Nurnberg* (BR.), *Stettin* (BR.), *Stuttgart* (BR.), *Danzig* (BR.), *Munchen* (BR.), and *Lubeck* (BR.). To France, 5: *Emden* (BR.), *Konigsborg* (IN.), *Regensburg* (IN.), *Stralsund* (IN.), and *Kolberg* (IN.). To Italy, 3: *Pilau* (IN.), *Graudenz* (IN.), and *Strassburg* (IN.). To Japan, 1: *Augsburg* (BR.). To the United States, 1: *Frankfurt* (BR.).

"*The flotilla leaders.*—To France, 1: *S. 113* (IN.). To Italy, 1: *V. 116* (IN.).

"*The destroyers.*—To Great Britain, 39: S. *137* (BR.), *V. 128* (BR.), *V. 125* (BR.), *B. 98* (wrecked), *G. 95* (BR.), *G. 92* (BR.), *V. 82* (BR.), *V. 81* (foundered), *V. 73* (BR.), *V. 71* (BR.), *S. 54* (foundered), *S. 51* (foundered), *V. 44* (BR.), *V. 28* (BR.), *V. 26* (BR.), *S. 24* (BR.), *T. 197* (BR.), *T. 195* (BR.), *T. 193* (BR.), *T. 192* (BR.), *T. 189* (BR.), *T. 186* (BR.), *T. 184* (BR.), *T. 183* (BR.), *T. 182* (BR.), *T. 180* (BR.), *T. 179* (BR.), *T. 178* (BR.), *T. 176* (BR.), *T. 174* (BR.), *T. 173* (BR.), *T. 169* (BR.), *T. 166* (BR.), *T. 165* (BR.), *T. 164* (BR.), *T. 163* (BR.), *T. 161* (BR.), *T. 160* (BR.), and *T. 159* (BR.). To France, 11: *H. 147* (IN.), *H. 146* (IN.), *S. 139* (IN.), *S. 135* (IN.), *S. 134* (IN.), *S. 133* (IN.), *V. 130* (IN.), *V. 126* (BR.), *V. 100* (BR.), *V. 79* (IN.), *V. 46* (BR.). To Japan, 4: *V. 127* (BR.), *V. 80* (BR.), *S. 60* (BR.), and *T. 181* (BR.). To Italy, 2: *B. 97* (IN.), *S. 63* (IN.). To United States, 3: *S. 132* (BR. at New York), *G. 102* (BR. at New York), and *V. 43* (BR. at New York).

"*The torpedo boats.*—All these 50 boats are allocated to Great Britain to be broken up, with the exception of 6 to be selected by Brazil and 6 by Poland from those at Rosyth, which after disarmament are to be used for police purposes. The auxiliary vessel *Cyclops* is also to be broken up by Great Britain.

"The German battleships named above were, with the exception of the *Baden*, a later vessel, at the Battle of Jutland, where they formed the first squadron, under Vice Admiral Ehrhard Schmidt, with his flag in the *Ostfriesland*. The total displacement of these nine battleships broken up was 192,160 tons. All the light cruisers may be regarded as fairly useful vessels, and of those which France and Italy have incorporated in their fleets none is more than 10 years old, the still older ones falling to this country to be broken up. The destroyers are naturally of many types and classes. The V class, built at the Vulcan Yard, Stettin, were begun in 1911–12, when all boats of an earlier date were indicated by the initial letter T. The other letters indicate the names of the builders' yards, and those of higher numbers than B. 97 and B. 98 are of larger types.

Austrian Surrenders.

"The ships of Austria-Hungary which have been surrendered comprise 13 battleships, 2 cruisers, 9 light cruisers, 19 destroyers, 55 torpedo boats, 10 torpedo gunboats, and 4 mining vessels. These vessels have been thus distributed:

"*The battleships* (all of which have been broken up).—To Great Britain, 6: *Erzherzog Ferdinand Max*, *Babenberg*, *Arpad*, *Habsburg*, *Budapest*, and *Monarch*. To France, 3: *Prinz Eugen*, *Erzherzog*, *Friedrich*, and *Erzherzog Karl*. To Italy, 3: *Tegetthof*, *Zrinyi*, and *Radetzky*. The two cruisers *Sankt Georg* and *Kaiser Karl IV* are also allotted to Great Britain to be broken up.

"*The light cruisers.*—To Great Britain, 6: *Admiral Spaun*, *Sziget-var*, *Aspern*, *K. U. K. Maria Theresa*, *Panther*, and *Leopard;* all these are to be broken up. To Italy, 2: *Helgoland* and *Saida*. To France, 1: *Novara*. These three ships will be incorporated in their respective fleets.

"*The destroyers.*—To Italy, 15: *Lika* (IX.), *Uszok* (IX.), *Friglav* (IX.), *Orgen* (IX.), *Csepel* (IX.), *Balaton* (IX.), *Tatra* (IX.), *Varasdiner* (BR.), *Huszar* (BR.), *Dinara* (BR.), *Velebit* (BR.), *Czikos* (BR.), *Turnl* (BR.), *Uskoke* (BR.), and *Scharfschutze* (BR.). To France, 3: *Dukia* (IX.), *Reka* (BR.), and *Pandur* (BR.). To Greece, 1: *Ulau* (IX.).

"*The torpedo boats.*—To Great Britain, 13: *50* (E.), *51* (T.), *53* (T.), *55* (T.), *56* (T.), *57* (T.), *58* (T.), *59* (T.), *8*, *9*, *10*, *14*, and *18;* all to be broken up. To Serbo-Czecho-Slovakia, 11: *87* (F.), *93* (F.), *96* (F.), *76* (T.), *77* (T.), *78* (T.), *79* (T.), *69* (F.), *54* (T.), *60* (T.), *61* (T.): all for police duties. To Greece, 7: *98* (M.), *99* (M.), *100* (M.), *92* (F.), *94* (F.), *95* (F.), *96* (F.); all for police duties. To Roumania, 7: *82* (F.), *83* (F.), *84* (F.), *74* (T.), *75* (T.), *80* (T.), and *81* (T.); all for police duties. To Portugal, 6: *85* (F.), *86* (F.), *88* (F.), *89* (F.), *90* (F.); all for police duties: and *91* (F.). To Italy, 6: *52* (T.), *1*, *2*, *4*, *5*, *6;* all to be broken up. To France, 4: *13*, *15*, *16*, and *17;* all to be broken up. The torpedo gunboats are all to be broken up; one will go to France; the remainder are taken over by Italy. Of the mining vessels, also, two are allotted to Great Britain for breaking up and two to France for the same purpose.

"Although the share of the Austrian ships which has fallen to Great Britain is, as might be expected, numerically large, several of the more useful vessels are going to other powers, where they will be found, no doubt, particularly valuable for the purpose to which they are destined.

"The greater part, however, of both the German and Austrian Navies is, as these lists show, doomed to destruction."

MODEL FOR TEACHING RULES OF ROAD AT SEA.

Source: A Report by Capt. Caulfield, C. B. E., R. N.

(13675.)

30 April 1920.

Having devised the above model, on which, besides being able to exhibit at will all combinations of masthead lights and bow lights, I have 36 other models on it and a system for teaching compass. A secondary battery is attached.

This is a large improvement on a rough model I used in *Britannia*. Thirty-two cadets in 1887 were prepared by me for examination in the subject; all received first-class marks, 28 obtaining full marks.

If you look favorably on my model, will you apply for me to be sent to exhibit it and explain my way of teaching? Capt. Marriott, the first sea lord secretary, has been approached on the subject; so that if you apply he will place the matter before Sir Rosslyn Wemyss, and if approved no doubt the A. C. R. will grant me permission to proceed.

The late admiral commanding Australian station asked me for drawing of it, which he obtained, as did also the Nippon Yusen Kaisha.

Rules of Road at Sea.

This instructional model has been devised with a view to familiarizing the naval officer from his early youth with the rules, regulations, and lights laid down by the Board of Trade for avoiding collisions at sea.

I first commenced work on this model in 1885, when first lieutenant of H. M. S. *Britannia* cadets' training ship, and since have added the approaching ship in front of vertical board, with the other ships on the projecting arms, those on right showing lights by night, those on left showing distinguishing signals by day. I remember during my three years in that ship preparing a class of 32 cadets in this subject for their passing-out examination.

All received first-class marks.

Twenty-eight received full marks.

They were always asking me when their turn would come to be taught by the model. My reply was, "At the right time." They came twice to maneuvering of model and twice to lectures with their notebooks to take down questions and answers. They never asked to come again, they had caught on, and their precious time was required for some subject that they had not mastered.

In those days of rapid transit the officer of the watch must make up his mind like a "flash," for at the rate the present leviathan goes, going full speed astern from full speed ahead, takes time, to

say nothing of the shock of the engines. The question is as regards a crossing vessel: If she is on my starboard hand, can I pass ahead of her, or must I pass astern, for it is my duty to "give way"? Overtaking and meeting ships is simply work, but collisions of late have always been cases of vessels thinking they can cross and just failing to do so.

Construction.

The vertical board has behind it a combination masthead light lantern, which shows through three holes cut in it lower down and on each side holes are cut for bow lights. The masthead lights are worked by a horizontal wheel, called the operator, placed just in front of wheel of working vessel close to it. The bow lights are worked in going abaft.

Instruction.

By means of operating wheel you produce red, white, red light.

Q. What is that?

A. Telegraph ship lying to her cable, all-round lights visible on a clear night 3 miles. Press down pedals and produce bow lights. At once the scene changes.

Q. Why?

A. (1) Because she is showing both bow lights, and is therefore coming straight at me; (2) she is paying out cable as she is showing her bow lights.

Q. What are you going to do?

A. Give her a wide berth by altering course to starboard.

Q. Why don't you port the helm?

A. I do; but altering course to starboard is the correct reply, as in the German Navy tiller is the reverse way. Then by dropping shutter of green light red is shown to red "Perfect safety, go ahead." And so on through all the combination on masthead light lantern, using your bow lights as required. Then take into consideration the many vessels which lie around you, explaining their distinguishing signals, etc.

The Steering Model.

Young officers and boys when going to wheel invariably try to bring point of compass (the course) to lubber's point, instead of lubber's point to point of compass. This idea must be broken at once, and it can be easily done by placing a painted compass on board or canvas on deck in same direction as movable one on model, to which you have affixed to bows a pointer.

Let them both be north.

Cover up compass of model and order the helmsman to alter course to northeast. He will at once swing to starboard, as one on deck

can not move; when pointer is over northeast, take away your hand and both are same.

Explain that compass needle is always pointing to magnetic pole; vibration and rolling of ship makes it deviate, but it always returns. The card should be used when explaining lights and distinguishing signals.

Rules of the Road Instructional Model Masthead Lantern.

2 red lights——Vessel not under control.
1 white light (with bow lights)——Steamer.
2 white lights (with bow lights)——Steamer towing a craft.
3 white lights (with bow lights)——Steamer towing two or more craft.
Red, white, red (with bow lights)——Cable ship paying out cable.
Tricolored light:
With white beneath——Steam trawler.
Bow lights only——Sailing ship.

Booms.

1 (A) Lightship signaling "You are standing into danger"——By day, code signal flags J. D.
By night, Morse code (U) by flashlight.

2 (A) Lightship out of position——By day, distinguishing marks struck.
By night, red lights forward and aft, with red flare every quarter hour.

3 (A) Lightship adrift——By day, hoists signal flags D. B.
By night, two guns followed by a rocket.

1 (B) Vessel not under command——By day, two black balls vertical.
By night, two red lights vertical.

2 (B) Wreck marking vessel (channel clear to starboard)——By day, three black balls.
By night, three white lights.

3 (B) Wreck marking vessel (channel clear to port)——By day, three black balls.
By night, three white lights.

1 (C) Steam trawler——By day, displays a basket on nearing her.
By night, green, white, and red lantern at masthead, with white light below it.

2 (C) Sailing trawler——By day, displays a basket on nearing her.
By night, white light at masthead, or as an alternative red and green masthead lantern, with white light below it.

3 (C) Cable ship——By day, two red globes and white diamond.
By night, red, white, red, lights.

1 (D) Drift-net vessel——By day, foremast lowered, mizzen set.
By night, two white lights; lower one indicates direction of nets.

2 (D) Steam pilot vessel	By day, displays flag, white and red horizontal. By night, white light, with red light under.
3 (D) Sailing pilot vessel	By day, displays flag, white and red horizontal. By night, white masthead light and flare.
1 (E) By day, starboard hand buoy	Conical buoy.
2 (E) By day, starboard hand buoy	Can buoy.
3 (E) Fairway buoy	Dome topped buoy.
4 (E) Wreck buoy	Conical buoy painted green.
5 (E) By day, perch	Made in various forms.
1 (E) By night, revolving light buoy	Light gradually increasing to full brilliancy then decreasing to eclipse.
2 (E) By night, intermittent light buoy	Steady light with at regular intervals a flash of greater brilliancy.
3 (E) By night, occulting light buoy	Steady light with at regular intervals a sudden and total eclipse (duration of darkness less than that of light).
4 (E) By night, flashing light buoy	Single flash at regular intervals (duration of light less than that of darkness).
5 (E) By night, fixed light buoy	Continuous steady light.
Abaft vessel, dredger by night	Dredger by day.
Three red-triangle light	Three triangle black balls or shapes.

AMERICA'S CHALLENGE ON THE SEAS.

Source: Cape Times.

(12510.)

18 September 1920.

"The development of a powerful mercantile marine, which has already been carried to a point at which it threatens serious rivalry to the British merchant service, is a natural corollary of the great naval effort America is making to achieve supremacy at sea. Six years ago the United States owned only 4.7 per cent of the world's seagoing tonnage. To-day she owns 24 per cent. Contrast this with the figures of British shipping. Before Armageddon convulsed Europe the United Kingdom owned 41.6 per cent of the world's tonnage. To-day, in spite of phenomenal efforts to make good war losses, her holding represents only 33.6 per cent, and this figure, it is well to bear in mind, includes the two million and odd tons of shipping which Germany has handed over in part reparation for the deeds of her U boats. Clearly, here is a commercial change of the greatest world importance. From quite a lowly place in the list of shipowners America has jumped into second position, not merely filling that position as comfortably as Germany did before the war but filling it almost corpulently. In 1914 Germany owned 5,135,000 tons

of merchant shipping. At the end of this year, if estimates of output are realized, America will own three times that amount. Calculations vary, but it is from an American source that we derive the figure of 18,000,000 tons as the probable total of United States shipping by the close of 1920, and fully 14,000,000 tons of this amount will have been built for the ocean trade and not for traffic on the Great Lakes. In part this extraordinary expansion has been due, as we shall see, to a loyal effort to serve the best interests of the Allies in the struggle with Germany, though by a happy chance those interests have coincided with the needs of American business. And in part it has been brought about by the conscious effort of the United States 'to take the place we are entitled to on the seas as the world's foremost nation'—to quote an official exposition of policy in Congress.

"Taking the latter cause first, it must be admitted that good ground existed for the dissatisfaction felt by a large body of Americans, for a considerable period anterior to the war, at their dependence on foreign shipping. In 1810 no less than 92 per cent of American exports was carried in American ships. In 1914 only 9.7 per cent of the total foreign trade—both imports and exports—was conveyed in vessels belonging to the United States. What more natural than that Americans should ask themselves, 'Why should this be?' and that the answer should give an added zest to the unaccustomed task of shipbuilding to which the Nation devoted itself, with characteristic enthusiasm, on its entry into the war. National pride became pledged to the resuscitation of a neglected industry, which for many excellent reasons—economic and technical—had never been really securely established in American waters. And now that the war is over that pride is proving an invaluable ally for the Pan Americans who are plunging the Nation into a gamble for domination at sea. Yet, allowing all this, the fact remains that America's entry into active competition with Great Britain for the ocean-carrying trade of the world is largely a fortuitous result of Great Britain's own war needs. If there was a certain amount of coldness and hesitancy about America's attitude during her 'too proud to fight' mood, there was no possible doubt of the ardor of her people when she had taken the plunge. Her first question was in what ways she could contribute most powerfully to the Allies' victory, and she had not been in the war a day when she was told that no contribution she could make could be of much greater importance than the building of merchant ships to replace the disastrous wastage resulting from the submarine campaign—a wastage that for a period of six months threatened to bring about the absolute collapse of the allied cause. So, with unhesitating loyalty the Government of the United States created shipyards where no shipyards had previously existed, col-

lected an army of inexperienced workers and had them trained to this novel form of enterprise, and, by a system of mass production, started to produce ships. While the Clyde shop stewards were mouthing pacifism, what time they were not inciting the trade-union worker to resist 'dilution' of labor, the Hog Island shipwrights were teaching teamwork and the maximum utilization of labor-saving machinery.

"The result we now see. To do America justice, there was no thought of any ulterior gain while this great scheme of construction was being initiated and executed. *If there had been, there could scarcely have been such readiness to lay down ships of a type which are ill-adapted for the keenly competitive conditions of a modern race for sea supremacy, such as the wooden and small iron vessels which America produced when the Allies were clamoring for quickly built craft of such a size that no one ship would be a serious loss if it were submarined or mined.* The thoughts of a great national mercantile marine has been the product of later days, though it has mated so happily with the ambitions of American manufacturers who have had their shrewd eyes on the capture of many markets since August, 1914, that design and not chance would seem to have brought about the union. The war ended before any considerable proportion of the ships for which the new shipyards had contracted had left the stocks, and America was left in a dilemma: What was to be done with all these yards and contracts? Were they to be scrapped? It was then that American national sentiment made the discovery, which the Commerce Committee of the Senate has since confirmed, that 'nations are not free which depend upon foreign fleets to carry their products and bring to them their supplies.' And, by way of gingering up the challenge to British sea power, the Commerce Committee has gratuitously added: 'The peace of the world is not secure so long as one nation wholly dominates the carrying trade.'

"So far, however, we have seen only one side of the picture. A position has already been reached in which shipping sailing under the United States flag is able to play a rôle three times more effective than that played by the German mercantile marine up to 1914; and it may even be that this competition will be to the good of commerce generally by bringing about beneficial rates of freight. (In point of fact, this year, according to the London Times, freights have been steadily falling, with certain exceptions, of which South Africa, unfortunately, is one.) But it is by no means certain that this development can continue at the rate at which American sentiment may desire.

"The facts of economy and geography have quite as much to say as national ambitions in determining mercantile supremacy. America was not a big shipbuilding nation before the war, because Great Britain, with its centuries of sea tradition and its trained shipyard personnel, could build ships better and more cheaply than she could. The war has changed a good many economic conditions, but it has left all the major geographical features of the world unchanged, in spite of the blasting of every contour line from Nieuport to the Argonne. And the geographical and national necessities by which the great British merchant service was created and sustained are in every detail the same as they were before 1914. Moreover, the economic factors, too, are still against the United States shipbuilder. The cost of manufacturing first-class cargo ships in America to-day is about $110 per gross ton as compared with $87 in Great Britain. If this disproportion persists, it is highly improbable that the indefinite expansion of the American mercantile marine can be continued once the effects of the artificial stimulus of war production have ceased. There is also the further economic consideration that if the British Empire is to buy the natural produce and the manufactures of the United States, it must be able to perform remunerative services in return. And hitherto ocean transport has been one of the most profitable and useful services which the United Kingdom has been able to render to America. To deprive her of future opportunity of making this useful exchange would be to disturb the delicate economic poise in which the trade relations of the two nations have hitherto been balanced to the mutual benefit of both. American ingenuity and British sagacity between them may find some other way of restoring equipoise. But, in any event, America's bid for a very large share of the world's shipping trade can not have for the British Empire the same grave concern that her challenge for naval supremacy must inevitably create. It will be odd if, under the spur of competition (which all the world so badly needs) the British mercantile marine fails to reproduce that wonderfully efficient service which was the chief secret of its commanding position on the ocean trade routes of the world before the nations willingly jeopardized her proud place by embarking on a war in defense of the liberties of civilization."

TYPE OF JAPANESE PROPAGANDA PUBLISHED IN "TSINAN JIH PAO"—A PAPER WHICH IS PUBLISHED IN CHINESE BUT JAPANESE OWNED—ON THE VISIT OF THE AMERICAN CONGRESSIONAL PARTY TO TSINAN, SHANTUNG.

Source: Japanese Press.

22 September 1920.

(11779.)

[Translation by an American residing in Tsinan.]

THE DIPLOMATIC HISTORY OF THE UNITED STATES—"JUSTICE" AND "HUMANITY" ARE EMPTY WORDS—WE CAN JUDGE THE FUTURE ONLY BY THE PAST.

"In recent years all the Congressmen, politicians, and captains of industry in the United States as well as the benevolent missionaries have unceasingly accused the Japanese Nation of militarism and territorial ambition. They attack not only the Japanese but all those who depend upon military power to carry out their policies."

"In light of such talk let us take a look at America's military history since the Revolution in order to discover the real America. The War of 1812 lasted two years and eight months, from July, 1812, to March, 1815. The six months from November, 1817, to May, 1818, were taken up with the first Seminole War, and the five months from March to August, 1832, with the Black Hawk War, while the second Seminole War, six years and eight months—from December 7, 1835, to August, 1842. The Mexican War began in January, 1846, and ended in February, 1848, thus lasting two years and one month. Four years and one month, from February, 1861, to May, 1865, were consumed by the Civil War, while the Spanish War lasted only three months—April to July, 1898. The Philippine War lasted three years and one month—from January, 1899, to August, 1901. From June to August, 1900, the United States was occupied with the Boxer Rebellion, and from March, 1916, to January, 1917, two years and one month, she invaded Mexico. Finally, from April, 1917, to November, 1918, one year and seven months, she took part in the European War."

"From the above facts we learn that within 110 years the United States fought 11 wars, large and small, covering a period of 20 years and 8 months. In other words, the United States had one war a decade and spent more than a fifth of a century in fighting. Investigation shows that one-eighth of the whole American people were engaged in the Civil War. As compared with the Japanese, only one-tenth of whom took part in the Russo-Japanese War, the Americans may be called warlike."

"A study of American diplomatic history reveals this fact even more forcibly. For brevity's sake we shall mention only the most salient points."

(1) "Seventy years ago the Americans aided Texas to separate from Mexico and soon afterward annexed the State. Moreover, without any excuse, taking advantage of Mexico's internal turmoil, the United States sent her armed forces to occupy Arizona, New Mexico, California, and other places."

(2) "When Cuba rebelled against Spain, the United States, because an American ship had been sunk in Spanish territory, declared war against Spain and in the course of 100 days completely defeated Spain and annexed both Cuba and the Philippine Islands. All this happened barely 20 years ago."

(3) "After these things she got all the important places in the Pacific Ocean by means of her tricky devices. While England was trying to subdue Hawaii by military force the Americans enticed the ignorant natives through the influence of the missionaries. This scheme was first tried 70 years ago, but not until after the annexation of the Philippines and of Guam as a result of the Spanish-American War was Hawaii annexed. It is because the United States wants to extend her territory in the Pacific that she pays so much attention to the Panama Canal. Since Panama was originally a small State of Colombia. it was easy for the United States to realize her ambition. When Panama declared her independence the United States was the first to recognize the new Republic, in return for which Panama gave the United States west of the canal as a perpetual concession a strip of territory 40 nautical miles long and 10 nautical miles wide. In due time the canal was dug. Although, like the Suez Canal, the Panama Canal is an international highway, the United States unhesitatingly erected forts and heavily garrisoned them.

"The whole world knows this. Now, it is reported that the island of Tampico (?) on the Pacific terminal of the canal and belonging to Panama has also fallen into the hands of the Americans, who had already fortified the place in spite of the violent protests of the people of Panama. The above facts show that since the beginning of the twentieth century the United States has often been guilty of aggression. When the United States, the propagandist of justice and humanity, does this, what may not be done by countries without any regard for such ideals?"

"Everyone remembers the activity of America during the European war. The spirit of America toward the war is indicated by the fact that only one-thirtieth of the people participated in it. Although America recommended at the peace conference the restriction of military power, the expansion of the American Army

and Navy is viewed with apprehension by the foreign powers. Before the war the United States had only 120,000 regular soldiers, but after the conflict she increased their number to 300,000. Still unsatisfied, she goes on to train 650,000 soldiers every year for voluntary service. Moreover, the military officers are ordered to act as instructors in training these volunteers, and rewards are given to all instructors for meritorious work. In order to further encourage military training, contests among students from military colleges are held every year at Washington. All military officers under the Minister of War are ordered to be present at these contests. Since the war the United States has opened institutions for training officers, and university and high-school graduates may enter these institutions, where they are trained at Government expense. After graduation these students qualify as officers for future wars. Last summer there were 317 such institutions, attended by more than 106,000 students. It is a matter for comment that when 180,000 people were trained as military officers at the time of the European war, more than 100,000 students have been trained since as military officers."

CONDITIONS IN GERMANY.

Source: Reliable.

2 November 1920.

The general conditions are fair, the recent crops have been good, but there is a considerable shortage of food, and it is estimated that there will be hunger in Germany this winter, and the conditions may approach those that existed during the winter of 1918–19.

The people are very much unsettled; they do not know what they have to do and, therefore, they are more or less existing day by day with no definite plans. It is recognized that the Government is very weak and that enormous taxes are being collected, but no one can give you a satisfactory answer to the question, "Where is the money going?" It seems that graft prevails among most of the Government officials. The German people as a whole desire to be ruled and are very efficient in carrying out instructions. My opinion is that the German people are tolerating a weak Government at the present time in order that the Allies may be more lenient in their terms, and as soon as some definite arrangement and agreement may be entered into with the present Government that it will fall and that there will arise in its place a one-man Government who will be supported by all classes, and then Germany will recover most rapidly.

The greatest asset the Germans now have is a large and efficient industrial population, which is in no sense Bolshevist. They are only anxious to work and to live, but they will not be happy until they

have a Government which they can respect, and in their mind that is a one-man power.

Many of the German industrial and banking establishments are largely controlled by foreign capital, and it was also noticed that the people are trying to get all they can, for the idea of the "Vaterland" which prevailed previous to the war is more or less disregarded.

A great many of the German industries were operated by most able men, who drew a very small salary, and it may be that when Germany returns to work her production will be less efficient, and, therefore, may not be such a serious competitor in the world's market.

As a rule the German manufacturer is able to compete in the foreign markets and at the same time earn about 100 per cent profit. The price he is now quoting is still with this 100 per cent profit and with his less efficient staff he is unable to obtain the same amount of business as in prewar days. But it is believed that this objection will soon be eliminated and that he will be content with a 20 to 30 per cent profit. It is also considered that the rate of exchange will allow approximately 50 marks per dollar, for owing to the increased cost of wages, which is about ten times the prewar rates, this rate must continue in order to enable them to compete in the world's market. During the summer, when the rate of exchange fell to about 40 marks per dollar, the amount of orders placed were very small, but as soon as the exchange increased there were orders from British and American firms, thereby permitting the plants to continue operation.

The Germans, as well as the French, are bitter against the British. The Frenchman believes that England is helping Germany and bringing pressure to bear on the French for easy terms, owing to the amount of British capital now invested in that country. The French are trying to destroy Germany economically, for they believe if they do not Germany will recover very rapidly and again make war on them. This time England would not come to the assistance of the French, as Germany has no more colonies or ships. The German has always been very intense in his feeling against the French—racial differences—and is only awaiting a feasible time to again attack.

A large number of workers are unemployed, and it is estimated that by January this number will be largely increased. This will mean a great deal of unrest and more or less local troubles may break out, but no one believes that Bolshevism will spread. This is principally due to the satisfactory housing condition of the German workman.

A large number of German ex-officers are now very bitter against the Kaiser. Their argument is as follows: The Kaiser was the

leader of about 100,000,000 people; each looked to him as their leader and had absolute confidence and faith in his judgment. At a time when he was most needed he deserted and fled to Holland. They state that if he had been a soldier or an officer he would have been pursued, captured, and shot. They also state that the Kaiser has proved that there is a weakness in the Hohenzollern dynasty, and, therefore, they will have nothing to do with any of the family.

JAPANESE PRESS.

Source: Reliable.

14 October 1920.

The general nature of press articles appearing in Japanese newspapers may be guaged by the following very brief extracts:

(*a*) "Question of life or death."

(*b*) "We can tolerate America's arrogance, but we can never endure her masterful attitude."

(*c*) "Ordeals that Japan must endure."

(*d*) "American obstruction of Japan."

(*e*) "A challenge to war."

(*f*) "The curtain has been ripped off from a racial war; justice is with us."

(*g*) "Alas! Has not the blood of the Yamato race come to boil yet?"

(*h*) "Outrageous acts of America."

(*i*) "The heights of insolence."

(*j*) "If the present state of affairs continues, and if America carries out her injustice, it is not impossible that the limit of Japanese forbearance may be reached."

(*k*) "No hope of friendship with America; the seeds of war have been sown; nothing left to compromise."

(*l*) "The policy which California is pursuing must be called inhumane and unjust."

(*m*) "Japan's defeat in California is equivalent to a defeat in China, as well as Korea. Why did not the premier state that the Government would carry through a policy of upholding the Nation's prestige through fire and water instead of hoping that the question would be satisfactorily settled?"

(*n*) "The question is far greater than the destruction of the Lusitania. It is time for the Japanese to make a great determination."

(*o*) "Japan might resign herself to the inevitable, squat on the ground, so to speak, and challenge the victors by saying: 'Cut me and strike me to your heart's content.'"

(*p*) "The Americans may be likened to the Tokyo cockneys. Their bearing may inspire their opponents with fear, but faced with an equal strong attitude they become faint-hearted."

(*q*) "To check the American economic development and to secure a supply of foodstuffs and other necessaries from the Asiatic Continent is imperative for Japan if she is to provide against American invasion in the future."

(*r*) "War will come next."

(*s*) "Japan has put up with all that can be put up with; nay, even with what it is difficult to bear, but there is a limit to forbearance. What if the limit of Japan's forbearance has been reached?"

(*t*) "Japan and America are dashing toward a position where a collision between them is inevitable. What will come next? Rupture of diplomatic relations? A Japan-American war? We do not know."

(*u*) "Selfishness and audacity are characteristics of American diplomacy. The selfishness and audacity of California is outrageous and preposterous."

(*v*) "When the clash with the United States comes."

(*w*) "Whether she is willing or not, Japan has to confront the situation. There is no evading it unless she sink down as a power. The question which concerns us is whether the people can summon the courage to meet the difficulties. Are they determined to suffer in order that they may come out regenerated? Life comes only with death. Those who defy death alone will live. The grand question facing Japan, therefore, is whether she has the courage to meet the death."

(*x*) "Japan has already sacrificed all to gain the good will of America. That is why I say that the American question has become the question of Japan's existence."

(*y*) "If the Japanese do not like to go to war, there will be no alternative for them but to submit to all manner of humiliation and tyranny."

(*z*) "Japan must gird her loins."

LEAGUE OF NATIONS—POSITION OF DOMINIONS.

Source: Melbourne "Argus."

(10796.)

31 August 1920.

"An interesting address on the work of the League of Nations was delivered last evening by Prof. Harrison Moore in the Independent Hall.

"The lecturer said that there was a popular belief that the league had done nothing. But if it had not yet accomplished anything

spectacular or dramatic it had certainly not been idle. Between January and June it had held six meetings, and a commission of jurists which it had appointed was preparing a scheme for a permanent court of international justice, which would be considered by the assembly at the meeting to be held in a few months. Another commission had formulated a health service, which had been put into operation in Poland with remarkable and valuable results. The league had also been engaged in many other useful activities designed to improve industrial and economic conditions. The failure of the league to bring to an end the ruinous wars now raging in Europe had caused disappointment, and even despair, but Great Britain, France, and Italy could not bear the burdens of the whole world, and until the United States and other great nations joined no permanent peace would be possible.

"Reference was made by Prof. Harrison Moore to the inclusion as individual members of the League of Nations of all the British Dominions. Hitherto, he said, Great Britain had spoken with a single voice. If each Dominion was now to speak with a different voice, the question might well be asked, How much of the British Empire remained? Some change was necessary to prevent a recurrence of the conditions under which one Government within the Empire could determine the foreign relations, the peace or war, of the whole of the communities of the Empire; but would it be changed by putting it within the power of every one of the Dominions to bring about the same result? It was no more logical to expect that Great Britain should allow her foreign relations to be affected by the action of several of her Dominions than that their relations should be governed entirely by all Great Britain's actions. Nobody seemed to understand exactly how much unity the Empire would retain. The words of those in authority in the different Dominions concerning the treaty of peace and the League of Nations showed a wide divergence of opinion. It was impossible to continue in a state of such uncertainty. Foreign nations had a right to demand to know with whom they were dealing. When they were dealing with the British Empire they would naturally want to know what exactly was the British Empire. Our constitutional arrangements must be made plain to foreign nations; but they must also be made clear to ourselves. It was easy to speak largely of the independence of the Dominions; of their being equal in status, if not in power, to other nations of the world. That was fine for the platform. But it did not answer the very serious question which must be answered if we were to preserve our good understanding with other countries. There was a strong feeling on the part of the United States that this division of the British Empire was an attempt to gain a tactical advantage over other nations. It was not difficult to appreciate their misunder-

standing on the subject, for he had found the greatest difficulty in defining in legal terms what exactly the division meant to the Empire and to its Dominions."

ANGLO-JAPANESE ALLIANCE.

Source: Reliable.

(7502.)

14 October 1920.

1. The Japanese commentaries on the Anglo-Japanese alliance are numerically about equally divided between those who consider it essential, those who consider it harmless, and those who consider it valueless and detrimental.

2. Those who consider it harmless see little to be derived either from its renewal or cancellation. But if it should not be renewed it would be somewhat of a blow to their pride.

3. The principal arguments of those who deem the alliance essential are: That the League of Nations is not and probably never will be an alliance with power. That although Russia is temporarily not to be feared there is no certainty that she will not regain her former power and become a menace to Japan.

4. On the other hand, those who consider it valueless contend that the United States, and not Russia, is Japan's real enemy of the future, and that the British reservation to the alliance as regards America destroys any real value or help that Japan might hope to derive from the alliance, while at the same time Great Britain would attempt to check Japan's legitimate expansion in the Orient, and might even attempt to force Japan to return the South Manchurian Railway to China, which would be unthinkable. Therefore, they contend that all the obligations are on Japan's side and all the good to be derived on Great Britain's side.

5. The Australian view reaching the local press is almost unanimous against renewal of the alliance, and the general opinion of British subjects living in the Orient seems to be that it is a useless compact.

CANADA'S YELLOW PERIL.

Source: London Times.

(13723.)

26 October 1920.

Japanese Pioneer Settlements.

Toronto, October 25.

"It is stated here that the Japanese are planning pioneer settlements in northern Ontario. A prominent Japanese, formerly con-

nected with the Japanese Legion in America, with a number of associates, is now visiting that part of the country. He refused to answer questions whether he was acting for Japanese colonization companies such as have established settlements in Brazil and Mexico.

"The Toronto Globe makes a vigorous protest against the general admission of Asiatic immigrants:

"*There are enough oriental families on the Pacific slope at the present time to produce a population of over 2,000,000 in less than a century at the present rate of increase.* The yellow peril is enough without adding to it indefinitely by the introduction of Chinese as farm laborers.

"The Globe says that it is not raising *the question of the superiority of the one race over the other.* Its point is that the oriental and the occidental differ not only in color, which perhaps is a matter of no great consequence, but in the entire outlook upon life. To mix them does not improve the race. To live in the same communities without a common social life and intermarriage, which becomes inevitable under such circumstances, would make a second South on the Pacific slope. *White and black America is bad enough.* White, black, and yellow would be impossible.

"The Winnipeg Tribune calls attention to the apparent determination of the Japanese to establish settlements along the Pacific coast of Canada and the United States.

"It says: 'Japan's urgent insistence upon the right to send her people where she pleases is a policy full of danger. It is playing with fire. Japan must know this, for the Japanese elder statesmen are very shrewd. Nevertheless the game continues. Is it because the Japanese Government realizes its people have not yet acquired the pioneer spirit? Is it because the elder statesmen have become convinced that Japan can retain her medieval absolutism only by invading lands where the way has been made smooth for them? It is probably time to ask Japan these questions.'"

CHINESE NAVAL OFFICERS TAKING COURSE AT JAPANESE HIGHER NAVAL COLLEGE.

Source: Reliable.

(9715.)

22 September 1920.

There are eight Chinese students taking the course at the Japanese Higher Naval College at Tokio, of the following rank:

(*a*) Three captains, 37 to 38 years old.

(*b*) Three commanders, 35 to 36 years old.

(*c*) Two lieutenant commanders, one is 38, the other is 33.

All of these Chinese officers have graduated from the Tokio Marine School in three groups, (*a*), (*b*), and (*c*), during the last 10 years.

Generally Chinese naval officers graduate from naval schools in their own country before going abroad to study.

The officers now taking the course at the Japanese Higher Naval College came to Japan from the middle schools of China.

The course at the Tokio Marine School is two years.

They then went to the gunnery and torpedo schools at Yokosuka and completed the six months' course there. They also did six months in the practice ship attached to the gunnery and torpedo school (a part of that course).

The course at the Japanese Higher Naval College is two years, but these Chinese officers are spending three years on this course. The one year additional is due to language difficulty. They will finish their three-year course in December, 1921.

Seven of these officers are now with the First and Second Squadrons of the Japanese Fleet at sea for the fleet maneuvers, which will take five weeks. The fleet left Yokosuka July 28. They are all in the same ship, and expect to remain afloat about two weeks.

None of these officers were present at the recent gun and torpedo practice of the First and Second Squadrons at Saegi Bay in the Inland Sea, near the Kii Channel.

In the summer of 1919, the Chinese naval attaché asked to go to the fall maneuvers, but was refused on the ground that if he was allowed to go the privilege would have to be extended to all other naval attachés.

The British naval attaché was allowed to go for Part I. The eight Chinese officers mentioned in paragraph 1 were allowed to go for Part I and Part III.

There are no Chinese at the naval school at Etajima.

BOLSHEVIK RUSSIA.

Source: Reliable.

(11502.)

29 September 1920.

68. Ships (a) Names, types, etc.

Armored cruiser *Gangut* (B).

Armored cruiser *Poltava*, sister to *Gangut* (B).

Battle cruiser *Petropavlosk* (A, B, C), 1911, 23 knots, 23,370 tons, crew, 1,100.

Battle cruiser *Sevastopol* (A), 1911, 23 knots, 23,370 tons.

Armored cruiser *Pavel*, sister to *Andrei Pervosvanni*, 18 knots.

Armored cruiser *Andrei Pervosvanni* (A, B), 1906, 18 knots, 17,680 tons; crew, 950.

Old battleship *Cesarevich*.

Armored cruiser *Alexander II*.

Armored cruiser *Rurik* (A), 1906.
Armored cruiser *Rossiya*.
Armored cruiser *Gromoboi*.
Armored cruiser *Admiral Makarov*.
Armored cruiser *Boyarin*.
Armored cruiser *Oleg* (G).
Armored cruiser *Bogatyr*.
Five gunboats, 60 torpedo boats, 25 destroyers, 18 submarines, 15 motor boats, 6 training ships, 5 transports.

NOTE.—For explanation of letters A, B, C, etc., see 68 (*b*) below.

68 (b). Condition for Service.

All ships somewhat old and rundown.
A—Commissioned and ready for action.
B—Suffered from C. M. B. attacks.
C—Sunk by C. M. B. attack; salvaged.

71. Offensive (a) Guns.

Petropavlovsk, twelve 12-inch guns.
Sevastopol, sixteen 4.7-inch guns.

78. War (a) Fleets.

Active fleet in 1919 was *Petropavlovsk*, *Andrei Pervosvanni*, *Oleg*, together with first destroyer flotilla *Garrill*, *Azard*, *Konstantin*, *Svoboda;* second destroyer flotilla *Vsadnik*, *Gardamak*, *Amuretz*, *Ussuretz*, and a few submarines.

THE DYESTUFF INDUSTRY IN JAPAN.

Source: Reliable.

(12417.)

22 September 1920.

Even with the new 35 per cent import duty, the Japanese dyestuff industry can not compete with American or German manufacturers. This refers to the smaller independent Japanese companies.

These smaller companies have been producing sulphur and direct colors, and they depend upon raw materials; i. e., intermediates. The big Nippon Senryo Kabushiki Kaisha in Osaka is a Government subsidized concern (an 8 per cent dividend quarterly). This company is able to produce almost all the common dyes, but it has not in the past been able to compete with the imported dyestuffs. It has confined itself to direct and basic colors. The firm will, on account of the guaranty, continue to exist and do business. Whether they can develop into a great industry, competing with American and German companies (as a result of the new tariff), is a question to be decided later.

An American thinks they can not compete successfully because of the lack of technical skill and the lack of a domestic supply of intermediates. The Japanese can produce almost any dye in the laboratory, as they have a few highly skilled chemists, but they lack the trained workmen to produce in commercial.

Japan being a great producer of textiles, it would be to the country's advantage commercially to admit dyestuff duty free, but the Government recognizes the necessity of encouraging the industry for use in time of war. The Japanese Government frankly admits the purpose of the subsidy.

GERMANY'S ARRANGEMENT WITH JAPAN FOR MERCHANT SHIPS.

Source: Reliable.

(7510–B.)

22 September 1920.

It is credibly reported that Von Knorr, ex-captain of the German Navy, and apparently in Japan as agent for several German steel companies, has recently made an arrangement with Mitsubishi and Kawasaki Shipbuilding Cos. to supply steel for 12 merchant vessels of 9,000 tons each, to be constructed at Kobe. The vessels to be German property, but to sail under the flag of Japan.

This construction will be very welcome to Japan, as it will furnish employment for a large number of the employees of these yards, which have been suffering like all other shipyards through the recent financial slump, and consequent reduction of Japanese trade. Further, there are so many Japanese merchant vessels laid up from shortage of cargo, that plenty of ships are available to carry the steel to Japan from Germany.

Owing to the exchange being against the mark, it is an excellent arrangement for the Germans to get vessels built in Japan and pay for them in steel. It seems very likely, too, that the Germans will go further and pay for the building with additional steel—probably fine tool metal—which is not made in Japan.

And the whole plan, which is a very secret arrangement, seems a well-planned scheme to defeat the indemnity clauses of the peace treaty regarding the merchant tonnage of Germany.

FRANCE.

Source: Reliable.

12 October 1920.

Enemy ships taken over and incorporated in the French Navy.

Type.	Former name.	Former nationality.	New name.
Cruiser	Regensburg	German	Strasburg.
Do	Koenigsberg	do	Metz.
Do	Stralsund	do	Mulhouse.
Do	Kolberg	do	Colmar.
Do	Novara	Austrian	Thionville.

Enemy ships taken over and incorporated in the French Navy.—Continued.

Type.	Former names.	Former nationally.	New name.
Destroyer	S–113	German	Admiral Senes.
Do	H–147	do	Delage.
Do	H–146	do	Regeot-de-la-Touche.
Do	S–134	do	Vesco.
Do	S–139	do	Deligny.
Do	S–133	do	Chastang.
Do	S–135	do	Mazare.
Do	V–130	do	Buino.
Do	V–79	do	Pierre Durand.
Do	Dukla	Austrian	Matelot Leblanc.
Submarine	U–79	German	Victor Reveillie.
Do	U–106	do	Jean-Autric.
Do	U–119	do	Rene-Audry.
Do	U–108	do	Leon-Mignot.
Do	U–139	do	Halbronn.
Do	U–163	do	Marrast.
Do	U–166	do	Jean-Roulier.
Do	UB–94	do	Trinite-Schillemans.
Do	UB–99	do	Corissan.
Do	UB–155	do	Jean-Corre.
Dirigible	L–72	do	Dixmude.

BRITISH-JAPANESE RELATIONS IN THE FAR EAST.

Source: Reliable.

(7502.)

14 October 1920.

During recent months the British planned to send 20 destroyers to the China station. Officers on these vessels were preparing to leave when the movement was canceled. It is reported that the cause lay in the embarrassment that would have resulted for Japan by such a further increase in British Asiatic forces.

British interest has been aroused in Japan's aviation developments in Formosa and in Japan's base in the Pescadores. These developments bear on the security of Hongkong in a somewhat similar manner to Corregidor. It has been said on good authority that the British occasionally keep a boat on patrol at Hongkong during the visits of Japanese ships.

Two Japanese men-of-war recently docked at Singapore. There was a strike among the dock coolies, who threatened to knock off work on the next Japanese ship that was docked at that port. Informant states that the British were much embarrassed by the occurrence and particularly so by being obliged to indicate the state of affairs to the Japanese Government so that further complications could be avoided.

ANDREWS WORLD CHAMPION 1000-YARD RIFLE SHOT.

Source: United States Marine Corps.

Gunner John J. Andrews, Marine Corps, member of the national match teams of 1906, 1911, 1919, and 1920, and winner of this year's Marine Corps cup match, gained additional shooting honors at Quantico, Va., on October 20, 1920, when he scored 33 consecutive bull's-eyes at 1,000 yards, using the ordinary Springfield rifle issued to the service, without telescopic sights, thereby establishing a new world's record. The old record was 31 consecutive bull's-eyes, the firer using a special rifle fitted with telescopic sights.

Gunner Andrews's remarkable feat was accomplished during a test of ammunition consisting of a 170-grain bullet and a charge of du Pont experimental powder No. 1044, this charge giving the projectile a muzzle velocity of 2,658 feet per second.

Prior to firing his record-breaking string Gunner Andrews made 12 bull's-eyes out of 12 shots at this range. The fact that he left the firing line for several minutes between this shooting and the string in which he established the new record prevented his total score from being 45 consecutive bull's-eyes.

CHANGES IN INSTALLATION OF BRITISH BATTLESHIPS.

Source: Reliable.

(9861.)

21 September 1920.

It has been learned from reliable sources that the following British battleships, which were originally designed for using both oil and coal as fuel, but were converted during the war to burn oil only, have recently been reconverted and are now burning coal exclusively:

Ajax.	Iron Duke.
Centurion.	Benbow.
Marlborough.	

It is also thought the *Emperor of India* should be included in this category.

It seems that as these ships are converted from coal burning to oil burning, and vice versa, the bunker space assigned to one or the other kind of fuel is not utilized when the other kind of fuel is used. Thus, at present on these ships, the space allotted for stowage of oil is not utilized in stowing coal nor anything else, and it will be very easy once more to convert the boilers into oil-burning boilers.

TRAWLERS BEING BUILT BY THE JAPANESE.

Source: Reliable.

(10787.)

14 October 1920.

It is reported on good authority that the Japanese are building 50 steel trawlers. It is thought that these are patterned after the steel steam trawler, *Diamond II*, 289 tons gross, which was bought by the Japanese from the British the first part of this year.

Some of these trawlers are being built at Uchida Shipbuilding yard, Yokohama, and some at the Asano Shipbuilding yard, near Yokohama.

A British sea captain who did mine-sweeping duty in the North Sea during the war saw two of these trawlers lying near Yokohama and said they were fitted as mine sweepers.

POPULATION AND MAN POWER OF CORPS AREAS IN THE UNITED STATES.

Source: War Department.

23 October 1920.

Corps area.	Population, 1920.	Males 18 to 45 registered for draft.	Physically fit effectives.
No. 9[1]	7,331,899	1,847,946	1,373,749
No. 6	12,784,159	3,034,550	2,404,525
No. 1	7,400,856	1,721,916	1,246,868
No. 3	12,913,701	2,938,696	2,309,445
No. 5	12,569,535	2,841,313	2,314,679
No. 7	12,539,876	2,806,585	2,292,242
No. 2[2]	15,060,293	3,328,808	2,563,721
No. 8	8,321,487	1,818,333	1,489,888
No. 4	18,124,058	3,570,429	2,826,943
Total	107,045,864	23,908,576	18,822,060

[1] Includes Alaska, population of 64,984, as shown by Government estimate for 1918.
[2] Includes Porto Rico, population of 1,297,772.

GUN POINTERS FOR JAPANESE NAVY.

Source: Reliable.

(3310.)

30 September 1920.

All men in Japanese Navy being selected for training as gun pointers are given physical examinations. The primary requisite is good eyesight. The secondary one is a reactionary test to determine how quickly a man responds physically to ocular impressions.

The men who successfully pass these tests are then given competitive training as pointers.

CHINESE NATIONAL FLAG.

Source: Reliable.

(4351.)

18 September 1920.

The Chinese national flag represents the five nations.

The five nations are indicated as follows:

Red stands for the Chinese.
Yellow stands for the Manchus.
Blue stands for the Mongols.
White stands for the Mohammedans.
Black stands for the Tibetans.

JAPAN—FORTIFICATIONS—OSHIMA AND HACHIJOJIMA.

Source: Reliable.

(12668.)

15 October 1920.

"The war office is spending 2,500,000 yen in fortifying the islands of Oshima and Hachijojima, repairing old fortifications, and also in perfecting new rifles and machine guns."

NOTE.—These two islands lie to the southward of Tokyo Bay toward Port Lloyd.

AVIATION.

COUNTRIES OF LATIN AMERICA, AIR SERVICE OF.

Source: Military Intelligence Division.

FOREWORD.

A picture of the aeronautical development in Latin America if taken to-day would show both progress and failure. Many of the efforts made at the conclusion of the Great War by foreign Governments to interest the nations of South America in aviation and their people in commercial air lines were failures. Large sums of money have been spent in Latin America by European Governments with little actually accomplished to date. The apparent interest of these countries at the close of the war was largely curiosity and did not lead to the orders for airplanes expected. Then came a period of more or less inactivity, which in turn is now being followed by a renewed interest based upon a better knowledge of the capabilities and limitation of aircraft and a realization of the excellence of post-war design.

A year and a half ago a great deal was being said and written about the establishment by Handley-Page of a mail and passenger line from Buenos Aires to Rio and Pernambuco, Brazil. Night flying over both land and sea, special hotels and stations for caring for ships and cargo were *proposed*, and concessions obtained from the Governments. Nothing has become of this, nor is it likely that anything will be done along this line soon.

Foreign "missions" visited nearly every Government in South America, but only in a few places has real progress been made.

In Argentina, where Italy's mission was backed by an appropriation of 10,000,000 lire and where France appropriated 8,000,000 francs for her mission, and where Great Britain has made special efforts to popularize her aircraft, only some 12 airplanes have been sold—6 by the English and French interests and 6 by the Curtiss representative. The Italians have made no sales in Argentina.

Chile, under the guidance of the English, has made good progress and to-day shows not only interest on the part of the Government, but a widespread popular enthusiasm on the part of the people. In every Province public subscriptions are being collected to buy for the

Army and Navy new types of planes. Government employees, workmen, and railroad employees have agreed to give one day's salary to the cause. Funds already raised run up into the hundreds of thousands, and it is hoped that 1,000,000 pesos will thus be raised by popular and voluntary subscription.

Flights of six planes each have been successfully flown from the capital to the northern frontier, and Maj. Huston, R. A. F., has recently placed additional orders in London.

Peru has had a bad record thus far in getting a start in aeronautics, but in spite of many accidents is now showing much interest and making progress along the right lines.

Late news from Colombia seems to show that following the failure of the French-Colombian Co. to continue operations, a German-Colombian company is now starting service from the sea to Bogota, using *Junker* airplanes and hydroplanes.

Small progress is being made in Brazil and in some others of the smaller countries of South America.

The Curtiss Aeroplane & Motor Co. seem to be making real progress, and, in spite of the fact that they are, unaided by our Government, coming into competition with the paid propaganda and subsidized companies of European countries, they are nevertheless selling both air and sea planes and making a good record not only for themselves but for American-built aircraft as well.

The personnel of the Curtiss representatives seems to be high and selected with care, some of them having been in Latin-American countries for 10 years or more, and doubtless knowing the language and customs of the people well.

The experience of the Curtiss triplane in Bolivia was, however, disastrous—the plane crashing after seven hours of flight, due to engine failure. While flying above mountains, themselves some 18,000 feet above the sea, a connecting rod broke and went through the crank case, and in landing both lower wings and the fore part of the fuselage were broken.

The new Government has decided that aviation is too expensive for the present in the high altitudes of Bolivia.

Mexico shows some progress and much activity *proposed* for the immediate future. Both British and German interests are making efforts to supply airplanes for commercial air lines, if not for the army and navy interests.

It would seem that in this country along our southern border it would be highly desirable to have Mexican air lines supplied with American-made land and sea planes, rather than to have same equipped and perhaps manned and directed by some European power.

Argentina, no Government Activity.

There are no rules or regulations in this country of national, municipal, or other authorities governing the operation of civilian and commercial aircraft. The Government is now studying as a possible basis the rules adopted by the "Allied Aeronautical Convention" in Paris in 1919.

There is no control whatever of civilian aviation. Anyone at present may fly a machine.

There are no existing air routes nor any proposed for establishment within a year or at a still later date. Although no air routes are planned, several companies, especially the Handley-Page Co., have at various times advertised that they will eventually start commercial aviation between various points. Some time ago the Handley-Page Co. sent out a report from England that it would start a regular service from Buenos Aires to Pernambuco, Brazil. This, however, has evidently been abandoned, and the same company is now talking of starting a regular service between this city and Montevideo. It is hard to say what will become of this.

Commercial and civilian aviation receive no governmental assistance. There are no Government services, other than the military, employing aircraft.

Aircraft can not be successfully manufactured in this country. There are not the facilities to manufacture motors, wings, cables, etc. The Argentine Government has constructed, or rather put together, four army machines, but all important parts were brought from abroad.

Foreign Activity, Great Britain.

The British Government has not sent over a large mission, but has been represented since early 1919 by Maj. S. Kingsley, who has recently formed the "River Plate Aviation Co.," representing the Aircraft Manufacturing Co. (Ltd.), of England. This has been done with the aid of Argentine capital and a number of English pilots.

The River Plate Aviation Co. was incorporated in Buenos Aires, Argentina, January, 1920, with a capitalization of $80,000 (United States currency).

The stock in this company is owned by Argentines, principally by Mr. H. C. Thompson, a prominent Anglo-Argentine of Buenos Aires, whose son is one of the aviators of the company. The company receives no Government assistance.

This company was organized principally through the initiative of Maj. S. Kingsley, formerly of the British Army, Maj. Kingsley and Mr. H. C. Thompson, jr., being the principal aviators. It is featuring passenger trips and short pleasure flights. Its principal object is

to popularize the De Haviland machine. Although the Aircraft Manufacturing Co. (Ltd.) would probably still maintain an agency here, the River Plate Aviation Co. could not last long if it were not for the financial support of Mr. H. C. Thompson.

The company has 11 machines—3 De Haviland 4's, carrying four people, and 8 De Haviland 6's, each carrying two passengers. These machines are employed in making the same kind of flights as the Curtiss Aeroplane & Motor Co. and the Compania Franco-Argentina machines. It is not possible to know what machines are contemplated as additions in the future.

This company has not been successful in either operational or service way, numerous slight accidents, due to bad pilots, having occurred.

Flying field.—The field which is located at San Isidro is owned by private parties and is leased in conjunction with the Compania Franco-Argentina de Transportes Aereos, is about 3,000 feet by 2,000 feet, and is about 12 miles from the center of commercial activity.

The field is not yet completed. Hangars, workshops, and assembling departments have been provided and good mechanics have been secured.

The Handley-Page Aeroplane Co.

Up to the present this company is carrying passengers on pleasure trips only, free of charge, as a means of propaganda. It will probably later enter into the rate agreement with the other companies.

This firm is just moving into its new field at Hurlingham, and will then be able to carry passengers at the same rate as the other companies. Its object now is purely to popularize the British machines.

This company has eight machines here—four Avros, two of which are two-passenger and two of which are three-passenger, two SE 5 machines, carrying one passenger each, and two De Haviland 9's carrying three passengers each. These machines are at present employed, as are the machines of the other companies, in carrying passengers. It is impossible to state what machines are contemplated for addition. This company controls the Aircraft Disposal Co. of England, which accounts for the fact that it is bringing here other types of machines such as the Avro and De Haviland. *All of these machines are old war machines.* It has no Handley-Page machines, which are too large for present commercial purposes here.

Italy.

The Italian mission, which came here in 1919, sent 20 machines of all kinds, with which they made some very good long-distance flights, one of which was Valparaiso to Buenos Aires, without stop, crossing the Andes. This mission before leaving made a present

of six aeroplanes to the Argentine Government. The Italian Government appropriated 10,000,000 lire for this mission.

France.

The French mission, which also came last year, brought 100 officers and men and 28 machines, for which they paid all expenses for six months. The official character of the mission has now terminated, and it is known as the "Franco-Argentine Aviation Co.," representing the firms of Farman, Breguet, and others, and being able to acquire material at a nominal price to be used for commercial purposes. In order to advertise their machines, they have offered here a new Breguet, with 300-horsepower Renault motor, for about $5,000 (United States currency), and training machines for about $2,000 (United States currency), delivered at Buenos Aires. The French Government appropriated 8,000,000 francs for this mission. Although the mission mentioned above came over as a military mission, yet, by reason of their financial backing, they were able to do some very good propaganda work for furthering commercial enterprise, and this is a very serious feature which American firms who try independently to sell machines in this market will have to meet.

Compania Franco-Argentina de Transportes Aereos, Buenos Aires, Argentina.—This company was incorporated in March, 1920, Buenos Aires, Argentina, and is capitalized for about $140,000 (United States currency).

The stock of this company is owned about half by French and half by Argentinians. In general, the French interests have supplied the machines, personnel, etc., and the Argentine stockholders have provided for the expenses in running them. The company represents the Farman, Breguet, de Marcay, and Potez aeroplanes and the Gnome motors.

The company does not now receive direct Government assistance, but was formed on the demobilization of the French aviation mission in Argentina, which was subsidized to the amount of 8,000,000 francs by the French Government. All of the machines which are used were given by the French Government, and it received supplies and machines from France at the lowest possible prices.

The company has the following machines: Three Breguet limousines, carrying three passengers each; three Breguet war machines, carrying two passengers each; four Farman 50 machines, carrying six passengers each; and two Spad single-seaters, carrying the pilot only. These aeroplanes are now employed in carrying on conventional pleasure trips and on short pleasure trips. It is not believed that any machines are contemplated for addition in the near future.

This company is active in advertising the French machines which it uses. It has no definite project as far as known of establishing

regular air lines or freight or passenger service, contenting itself with advertising the fact that it carries passengers at the rate given below.

Passenger rates are 1 peso ($0.4246 United States currency) per kilometer per person for specified trips and 4 pesos ($1.70 United States currency) per minute per person for short pleasure flights. There is no freight, express, or mail business.

This company is not successful at present from a financial standpoint and its receipts do not nearly pay expenses. As seen above, it has been heavily subsidized by the French Government. From an operational and service standpoint it may be said to be successful. Its principal object is to popularize the French aircraft.

Curtiss, United States.

The Curtiss Aeroplane & Motor Co. has sent a representative here with five land machines and one hydroplane and he has been able to do some very good work, but it is needless to point out that this company or any other American company would be able to compete on a much more favorable basis if the American Government had sent, or would even now send, a competent aviation mission here. Up to the present, considering the obstacles it has had to work against, the Curtiss Co. has done exceedingly well and enjoys high prestige, much of which is due to the fact that although the Italian, French, and British aviators here have all had a number of accidents, some of them quite serious, the Curtiss Co. has not had a single accident. A record like this redounds not only to the credit of the pilot but also to the credit of the machine, which is shown by the fact that the Curtiss Co. has already sold six machines here, in spite of its limited facilities for propaganda, having sold one machine to the Government and five to private amateurs, while the English and French have sold only six machines between them, the Italians not having sold any so far.

The Curtiss Aeroplane & Motor Co. since it has had a representative here has been very active. Mr. Leon has done much in popularizing this machine by instructing pilots for the Argentine Army, making special flights and by interesting lots of prominent people in aviation by taking them on short flights. It must be remembered that this company has not the financial backing which the other companies have.

The Curtiss Aeroplane & Motor Co.—This company has at present six machines here, four types JN, 90-horsepower training machine, carrying one passenger besides the pilot; one Oriole and one Sea Gull, each carrying three people. The latter is a hydroplane, the other five being land machines. These machines are now employed in carrying passengers to any point to which they may wish to go or in making "joy-ride" flights of a few minutes' duration in order to

popularize their machine. None of these machines are used in any Government service.

Aviation school.—This firm conducts an aviation school, the instructor being Mr. Lawrence Leon, the local representative of the Curtiss Aeroplane & Motor Co., who is an American citizen. Mr. Leon has trained two pilots for the Argentine Army and has helped in training others. The only other foreign aviator who has trained pilots for the Argentine Army is Maj. Scott, of the British mission, who has trained one. Mr. Leon is now training several other pilots.

Handley-Page Co. Gift.

Information from London is to the effect that the Handley-Page Co. has made a gift of two aeroplanes to the Argentine Military Aviation School.

The budget of the War Department for this year will permit the purchase of several new machines. The special committee designated to decide type of same has decided on eight Avro and eight Curtiss machines.

The arrival of a German civilian aviation mission, to arrive next summer, is reported.

Handley-Page British expedition.—The Handley-Page British expedition to Argentina has recently been appointed sole representative of the Aircraft Disposal Co. (Ltd.). It is reported that the Handley-Page British expedition to Argentina plans an active campaign of sales of said material and machines in this country.

Aerodromes in Argentina.—Of the four fields here, the Government field at El Palomar is not regularly available for commercial or civilian use. The fields of the Curtiss Co., the River Plate Aviation Co., and the Handley-Page Co. at San Fernando and San Isidro and Hurlingham, respectively, are available for commercial and civilian use and for emergency use.

New aerodromes and landing fields.—Soon after the publication of an order by the ministry of war prohibiting use of Palomar (military aviation school field) for commercial purposes active steps were taken by the Handley-Page, Curtiss Co., and River Plate Aviation Co. to open their own aerodromes and have their own landing fields.

The Handley-Page representative is building an aerodrome and has a landing field at Hurlingham on the Pacific Railroad line. The field is situated near the station, at a distance of about 50 kilometers from Buenos Aires.

The Curtiss Co. has opened its school at San Fernando, where it has established an aerodrome, hangars, workshops, etc., and has also an appropriate landing field. San Fernando is on the River Plate, about 30 kilometers from the capital.

The River Plate Aviation Co. has established headquarters at San Isidro.

The aviation field at San Isidro was opened on Sunday, 23 May, 1920, where a luncheon was given and exhibition flights given. The (British) River Plate Aviation Co. and the (French) Franco-Argentine Aerial Transport Co. are associated. The buildings, etc., are modest, being composed of four portable hangars. The opening exercises were attended by a large crowd and were very successful.

German Activities

Two German aviators, Lieuts. Curt Goebel and Herman Mayenborger, arrived here in March, stating that they came to study aviation conditions with the object of bringing their machines from Germany, especially for postal service. Nothing more has come from this.

Direct Radio Service Between Argentina and Germany.

A new German-Argentine radiotelegraph company has been organized under the name of the "Transradio" for the purpose of establishing direct radio service between Germany and the southern countries of South America. The capital of the company will be 10,000,000 pesos ($4,300,000), of which, it is claimed, 4,500,000 pesos are already subscribed in Germany. Subscriptions for stock are being received in Argentina, where considerable publicity is being given to the project. It is advertised that the station will be ready for use early in 1922 and that commercial messages will be sent at rates equal to approximately one-third of the present cable rates.

Wireless communication between Argentina and Germany was actually organized yesterday with the transmission of a message saluting President Irigoyen.

Italian Activities.

It is stated that an Italian company has organized a flying school at Buenos Aires and has appointed Capt. Laureati, a well-known Italian pilot, as director.

Bolivia—Military Aviation School—Decree of Former President.

Under date of 23 June, 1920, the military aviation school of Bolivia was founded by supreme decree of the then President, Dr. Jose Gutierrez Guerra.

On 21 July, 1920, a general order of the ministry of war outlined requisites necessary to enter the military aviation school of Bolivia.

The following is translated from El Diario, La Pax, Bolivia:

Under date of June 23, 1920, the following decree was issued by Jose Gutierrez Guerra, President of the Republic of Bolivia:

Whereas, considering that it is necessary to establish a military aviation school with the object of training aviators for service in the national army, decrees:

Article 1. To establish the military aviation school, which will depend directly from the general staff, and be commanded by an

officer of the army having field rank. He will carry the title of director and have the privileges, etc., which the laws and regulations concede to the commander of a regiment.

ART. 2. The personnel of the school will comprise the staff, the corps of instructors, officer students, corps of mechanics and workmen, and guards service.

ART. 3. The staff and the corps of instructors shall be designated by the Government.

ART. 4. Army officers who present themselves voluntarily and who possess the necessary qualifications exacted by the general staff may enter the school.

ART. 5. The period of their stay at the school shall be computed as active service.

ART. 6. Once the courses have been terminated, the officer students who have successfully passed shall receive the title of military pilots, and this will be noted in the army register.

ART. 7. The corps of mechanics will comprise:

(*a*) The mechanics in charge of motors and machines.

(*b*) Student mechanics.

ART. 8. Whilst in the school the student mechanics shall have the grade of sergeants, and they will be recruited by competition.

ART. 9. Candidates to enter school must fulfill the following requisites:

(*a*) To be on active service or to have performed military service prescribed by law.

(*b*) To sign a contract to serve in the army as aviation mechanics for at least two years after graduation from this school.

ART. 10. The students who have terminated courses satisfactorily shall receive the title of aviator mechanics.

ART. 11. The commander of the school shall draw up regulations for the school to be subjected to approval.

The minister of war is placed in charge of execution and compliance of this decree.

Chile—Public Interest—Popular Subscription for the Purchase of Military Aeroplanes.

The popular subscription for the purchase of military aeroplanes has passed 300,000 pesos, the city of Santiago having contributed 100,000 pesos so far.

The aim of the subscription is to have each Province of Chile present at least one aeroplane to the service, the machine to have the name of the Province presenting it.

Besides this, public employees have started a movement to devote one day's salary to the general fund. The officers of the army are going to contribute in an equal manner. The railroad employees are preparing to do the same and expect to be able to obtain enough funds to secure the purchase of one machine.

Mobilization of air planes.—Approximately 10 days ago one "flight" of six scout planes (Bristol) were sent to Arica and a "flight" of six bombing planes (De Haviland) will be sent to the same place soon.

Maj. Huston, of the English Army and instructor in Chilean aviation, reports that the Chilean Government has recently purchased six new training planes (Avro).

Maj. Huston, having been called in as technical adviser, has made a study of the services of supply by motor transport in the north, the Chilean Government being on the point of purchasing a number of trucks for transportation purposes, and a demonstration of the trucks will be made in a few days.

One million pesos to be raised—purchase of aeroplanes.—The patriotic movement now in progress all over Chile for the collection of funds for the purpose of presenting to the army one aeroplane from each Province continues and is assuming large proportions. Besides the private subscriptions, which in Santiago reached over 150,000 pesos and in Valparaiso over 180,000, and the allotment of one day's salary made by all public employees and the employees of the large mining and industrial enterprises throughout the country, a public collection was made during the last week which produced in Santiago over 200,000 pesos and in Valparaiso over 100,000. Patriotic stamps have also been put into circulation to increase the fund. It is hoped that more than 1,000,000,000 pesos will eventually be raised. All these subscriptions will be centralized and applied to the purchase of aeroplanes and aviation materials for the army and navy.

British Activity.

Commercial aviation—Gen. Livingston to organize service.—It is announced that very shortly Brig. Gen. Livingston, who is at present in the Argentine organizing the commercial aerial services there, will arrive in Chile, commissioned by the Handley Page combine to organize services of mail, parcels, and passengers between the principal towns of the country.

Gen. Livingston has had a distinguished career. He fought in the Boer War, in which he received various decorations. He introduced aviation into South Africa, and was rewarded with a special gold medal by the Government. He took a brilliant part in the late war, being mentioned in dispatches five times, winning amongst other decorations that of commander of the crown of Italy and that of Saint Stanislaus of Russia. He was appointed director of the aerial organization of the war ministry and director general of the staff. In 1918, at the request of the United States Government, he was sent to the United States to organize the American aerial service.

Aerial services have already been organized by the firm of Handley Page in Brazil and the Argentine, based on concessions from the Government, and it is hoped that the same will shortly be true of Chile.

Colombia.

The use of aeroplanes in Colombia is as yet only in the experimental stage, and no rules or regulations have been promulgated by national or other authorities, nor has the Government taken any steps to control civilian flying.

French Company.

Up to the present time three aviation companies have been formed, but only one of the three shows evidence of being a serious endeavor to establish airplane service. This company, known as the Colombian Aerial Navigation Co., was organized about a year ago in Medellin, and its stock, amounting to $750,000, is held by Colombians resident in that city and in the Department of Antioquia. The company first brought two scout planes from France, and put one in service between Barranquilla and Cartagena, while itineraries were being arranged and landing fields constructed. In April this plane fell from a height of 150 feet while making a turn in the beginning of a flight, killing the aviator and seriously injuring the two passengers, who had just embarked for a short flight over the city. Being the first airplane accident in the country, it caused a deep impression locally and has probably put a stop to aerial pleasure trips for some time.

The company has received recently a 10-passenger hydroplane equipped with two Hispano-Suiza motors, and it is intended to bring more machines of the same kind as soon as the service is developed. The line of flight from the coast to the interior will be along the course of the Magdalena River from Barranquilla to Girardot, the only river port having rail connection with Bogota. From the river landing places feeder services will be established to Bogota, Medellin, and Cartagena with smaller machines.

The machines purchased by the above-mentioned company are all Farmans, made in France, and it is not expected that any American planes will be purchased at the present time.

The company has made preliminary arrangements with the Government for the establishment of an aviation school.

The company has purchased landing fields at several points, as shown below, and intends to acquire others as the needs of the service demand. The location and dimensions of the fields are as follows:

Location.	Length.	Breadth.
	Meters.	*Meters.*
Barranquilla	700	600
Cartagena	700	300
Medellin	670	300
Puerto Berrio	[1]	[1]
Girardot	[1]	[1]

[1] No data.

German Company.

The other two companies mentioned have done nothing as yet to establish service. One, known as the "Sociedad-Alemana de Transporte Aieeas," capital $50,000, was organized locally several months ago by Colombians and Germans resident in this city on the strength of an assertion by a German just arrived from Germany that new aluminum frame airplanes could be purchased in marks at the current rates of exchange. When an order for one "Junker" airplane, 140 horsepower, 5 passenger, was sent in, however, it was discovered that the price in marks had been placed so high that the low exchange gave no advantage. This, together with the difficulty of getting airplanes out of Germany, has brought the development of the enterprise to a standstill, at least temporarily. If the company continues, it is planned to lease ground for landing fields in Barranquilla and Girardot.

Hydroplanes for the Magdalena, a Press Announcement in "El Tiempo."

"The first hydroplanes which were brought for the Colombo-German Co. for the navigation of the Magdalena, have just arrived at Barranquilla.

"The two just received are especially constructed to meet the conditions of the river, with aluminum as resisting as steel, and are made to carry mail as well as passengers.

"Together with the hydroplanes, German aviators have arrived to pilot the machines. The first trial flights will be held within a short time.

"No doubt exists as to the great success for Magdalena navigation to be gained through the use of such an excellent quality of hydroplanes as those manufactured in Germany. These hydroplanes are called upon to lend a most important service, and will probably be a great factor in the solution of the transportation crisis. Passengers and mail, above all, will no longer have to delay entire weeks during the dry season waiting for the river to rise.

"We look upon the advent of hydroplanes on the Magdalena as a symbol of effective progress."

Ecuador, Italian Activity.

Two Italian aviators, Elia Liut and Lieut. Juan Ancilloto, both of whom are said to have won distinction in the Italian Aviation Corps during the World War, arrived in Guayaquil on 26 July, 1920. They propose to initiate aerial navigation in Ecuador, and possibly may establish a school of aeronautics here.

The apparatus to be used is a biplane, M. D. Macchi model, equipped with a Diatto Frexs 130 horsepower 9 cylinder rotating motor and capable of developing a speed of 170 kilometers (105.6 miles) per hour, with a rising power of 5,000 meters (16,400 feet) in

13 minutes. It measures 8 meters (26.2 feet) from tip to tip and 7.25 meters (23.78 feet) in length.

This machine was imported from Italy by Sr. Jose Abel Castillo, owner and director of El Telegrafo (daily newspaper of Guayaquil) and will be known as *Telegrafo I.* It arrived 29 July, 1920; the work of setting it up was completed August 6, a trial ascension being made the following day, and on August 8 made its first exhibition flight, which was a success. Another ascension was made on August 10, one of the national holidays.

A flight over the Andes, from Guayaquil to Quito, a distance of approximately 300 miles, is announced for the near future.

Mexico, British Activity.

Reported organization of large company.—It is reported that according to information published in to-day's Mexico City press, arrangements have been concluded with the Government for the organization of a complete service of aerial transportation of passengers, mail, express, and freight between Mexico City and certain places in the Republic.

Negotiations were initiated by Maj. I. Locke, of the British aviation service during the war, first with the secretary of communications, later with the Mexican President, both of whom manifested a disposition to grant a concession necessary to the early establishment of such an aerial service.

The proposed plan was presented by Gen. H. C. Critchley, of Canada, Maj. I. Locke, and J. C. Trevino, the last named being a son of the late Gen. Geronimo Trevino, of Mexico.

Maj. Locke asserts, according to the published interview, that the scheme is backed by sufficient capital to establish such a service as that maintained between London and Paris.

It is proposed to bring the latest machines, among which will be the Handley-Page, of sufficient power to comfortably carry from 14 to 20 passengers. English and Canadian aviators will be engaged, whose ability is guaranteed by years of service in the European War.

As soon as the necessary concession is granted, a half million pounds sterling will be invested in flying machines.

It is expected to organize soon trips with large machines between Mexico City and Tampico and Mexico City and Vera Cruz. The promoters of this scheme have offered to place a permanent flotilla of war at the disposition of the Mexican Government.

Confidential note.—From reliable information, especially concerning the Gen. H. C. Critchley above mentioned, it is believed this to be a visionary project. Not long ago Gen. Critchley proposed to colonize a large number of English officers in northern Mexico, the elaborate details of the plan showing lack of experience and

quite impractical ideas. He has influential connections, and has no doubt been well received by prominent Mexican officials.

United States—Mexico Air Line.

Proposed air service in Sonora.—According to press reports, the government of the State of Sonora has agreed to pay to the International Air Service Corporation, of Nogales, Ariz., a monthly subsidy to assist in meeting overhead expenses in the establishment of the proposed aerial service for passengers, mail, and light express between Nogales and west coast points. In addition, the State will establish and maintain aviation fields at points in Sonora designated by the company, in furtherance of the service which this corporation will render the territory traversed. The concern is also to be exempt from taxation. An endeavor will be made to secure the contract for the transportation of federal funds collected from border points to Hermosillo. The customs receipts along the border in Sonora are reported to average about $1,500,000 monthly.

It is understood that a concession will be asked of the State of Sinaloa to operate in connection with the Sonora service.

Mexican Press.

There have begun to arrive at the office of the secretary of communications and public works proposals for initiating an aerial mail service.

The first proposal was from the Col. Baron Ernesto Merck, who offered four airplanes, "Junkers," at a price of $18,000 United States currency.

These planes will be ready in four weeks and freight on same from Europe will be 5,000 pesos.

The secretary of communications expects to receive other proposals before making a definite decision.

Shipment from Holland.

Vera Cruz, August 6, 1920.—By the next steamer from Holland will arrive at this port six Farman airplanes. It is hoped that these will arrive in good condition, as their shipment from Rotterdam was supervised by the Mexican consul there. Two former shipments of planes from Holland were completely destroyed en route, owing to poor packing and care in shipping.

Aircraft manufacture.—It is officially announced that in accord with orders of the President of the Republic work will be started in the national aviation school on the building of several "Farman" monoplanes.

The work will be done by Mexicans and Farman motors will be used, which have been for some time in Mexico. With the exception of the motors, all the materials will be exclusively Mexican.

Peru, Government Favorable to Aviation.

The Government has been favorable to the encouragement of aviation, but has been very much mixed over its position in matters of policy. Besides the French mission, there has been strong pressure both from American and English sources. At one time Maj. G. M. Dyott, representing the Handley Page Co., had considerable influence with the Government, but this appears to be a thing of the past. He now has no official position, either direct or indirect, but he has organized a company which may do something in the aviation line.

Within the past few days the International Aeronautic Co., "Compania Internacional Aeronautica," has been formed for the purpose of maintaining a civilian flying school and engaging in all branches of commercial aviation and passenger carrying. This company has the backing of the Curtiss Co., being organzed by Mr. C. W. Webster, agent of that company; Mr. L. R. Moore, formerly United States Navy and one of the crew of the *NC–3* on its trans-Atlantic flight; Mr. M. A. Mott, an American pilot; and Mr. A. E. Russel, who is also interested in the Consolidated Steel Corporation and business secretary to President Legina. It is all American capital, machines, and men, and is the first private commercial aviation enterprise started in Peru.

The Government thus far has shown a liberal attitude toward civil aviation.

French Officers Arrive.

Maj. Pierre Julian La Bruyers and Lieut. Paul Damiidaux arrived at Lima on the 6th of July to replace the two French aviation officers who were killed. Maj. Bruyers will be head of the aviation section of the French mission and at the head of the army aviation. This completes the aviation personnel so far as the French are concerned.

Cause of fatal accident.—The death of Mechanic Wheeler, brought to Peru by the Curtiss Co. for service with the navy, as heretofore reported, occurred on the 3d of July and is the seventh death in about seven months in this service in Peru.

The accident in which Wheeler was fatally injured occurred while the plane was being piloted by Walter Simon within two days after the arrival of the latter from the States. It is reliably reported that Simon was really not in condition to fly the machine. He had been enjoying himself pretty well on the trip down to Callao and had been lunched at a club on the day of the attempted flight. It is reported that he drove the automobile from Lima to the flying field in a very reckless manner, and it is believed the statement can be well substantiated that he should not have flown the machine.

Encouraging outlook for aviation.—There is great enthusiasm being shown in aviation in Peru at this time, even though Peru has had such bad luck in starting their aviation schools, as four pilots and two mechanics were killed within two months. It might be said to be in its infancy in this country.

Two French Missions.

The French Government has a military mission in Peru as well as an army aviation mission here. The commander of the aviation mission, Col. Julien la Bruyere, has just arrived here to replace Col. Debaudied, who was killed with Lieut. Chabrier a few months ago. There are four officers, three mechanics, and several helpers attached to this mission.

Originally the French mission had four Caudron training machines, equipped with 110-horsepower La Rhone rotary motors, but only two of these are now serviceable. They also have two Salmson tractor-type machines, with 260-horsepower radial-type motors. One Salmson is at Arequipa, Peru, and the other is at Maranga. Although the Salmsons are built for fighting, they are not equipped with machine guns as yet. The army aviation service has no ordnance equipment of any kind, nor have they photographic, wireless, or bombing equipment.

Army flying school.—The army flying field is located on the ocean front at Maranga, about five minutes' flight from Lima, and it is the only military aerodrome in Peru. It has a runway less than half a mile long and is not an ideal field, although about the best to be had. Two hangars of wood construction are located there, but they have no facilities for machine-shop work, except a workbench. Both civilian and army cadets are receiving instruction there.

Naval flying school, Curtiss equipment.—The naval aviation station is located at Ancon, which is connected with Lima by rail. The trip by rail between these two places takes about an hour and a half. Two hangars are now under construction there, and they will be large enough to accommodate 10 training machines. From present indications the station will not be ready for use for about a month. Mr. John Leguia, the President's youngest son, is in command of naval aviation. There are three American pilots and two mechanics connected with the Peruvian naval air service. There are 12 naval cadets now awaiting instruction at Ancon.

Six Curtiss flying boats of the "Seagull" type for instruction, with spare motors and a limited amount of aeroplane and motor spare parts, are now at Ancon waiting for the completion of the hangars. Two French flying boats of the Georges Levy type, with single Renault motors of 300 horsepower, are also there. They are second-hand machines and are in very poor shape. Two Norman

Thompson flying boats brought to Peru by the Handley Page Co. are also at Ancon. The Curtiss "Seagulls" are each equipped with Curtiss K–6 motors of 150 horsepower. These are all new machines and in very good shape.

The Peruvian Navy owns six Lewis machine guns for aeroplane instruction work and 10,000 rounds of ammunition for same, and three Eastman aeroplane cameras of the hand-held, oblique type used by the United States Army and Navy. These take pictures of the 4 by 5 size. The navy also owns three aeroplane wireless sets for receiving and sending from aeroplanes, of the Simon antenna type, with a radius of about 300 miles; two speed boats, having a speed of 40 knots per hour, are now en route to Peru from the United States. The Peruvian Navy has no bombing apparatus or anti-aircraft guns.

In addition to the Curtiss "Seagulls" there is one Curtiss JN–4 land machine of 90 horsepower and one Curtiss standard land machine of 90 horsepower at the Ancon station.

The two flying stations previously mentioned—Maranga and Ancon—are the only Government aerodromes in Peru.

British Company.

As reported from this consulate under date of January 5, 1920, the Peruvian Corporation intended inaugurating a flying-boat service between the principal Peruvian ports. The Norman Thompson flying boats were to be used for this purpose, two of which are now at Ancon. Both of them have been damaged and have not been repaired. One of their aviators started on a flight from Callao to Paita, but was unsuccessful, and since then they have done nothing. They are at a standstill.

American Company, Agents for Curtiss.

The Campania Nacional Aeronautica has just been formed in Peru by three Americans—Messrs. M. A. Mott, Lloyd R. Moore, and A. E. Russell—for the purpose of maintaining a civilian flying school and engaging in all branches of commercial aviation and passenger carrying. This company will also handle the sale of Curtiss machines in Peru, and is the first private commercial aviation enterprise in Peru.

Mr. Mott is an American pilot who has spent about 14 years in Latin-American countries. Mr. Moore has just been discharged from the United States Navy and after 12 years in the Regular Navy. He was one of the crew of the naval seaplane *NC. 3* on the trans-Atlantic flight. Mr. Russell is the representative of the Consolidated Steel Corporation and he has been in Peru several years, and is therefore well acquainted with the people and conditions of the country.

Training school to be started.—Through the cooperation of the Peruvian Government, they have secured the use of "Walter Pack Field" at Bellavista, which is about 15 minutes run from Lima by automobile. Construction will begin immediately of a hangar large enough for four Curtiss machines. A training school will also be started at once, and several students have already been enrolled.

They have three school machines for their classes and five other machines for sale. The object of the Compania Nacional Aeronautics is to do much flying of a consistent nature to overcome the bad impression caused by the many accidents here. They will maintain regular commercial flights and carry passengers. It is also their intention to secure contracts with the Government for carrying mail to the interior of Peru, especially to points where there is no train service. The Government also desires to send their mail to Iquitos by aeroplane, as it now takes from four to six weeks to get mail from there to Lima, but there is nothing definite relative to this.

The Curtiss Co. has just received in Callao six additional 90-horsepower training planes. Two more of these are expected from Buenos Aires. It is the plan of the Curtiss Co. to institute a training field, using three of these planes for that purpose with the expectation of selling the other five planes of the eight above referred to.

Public interest.—The employees of the Cerro de Pasco Corporation at Cerro de Pasco have arranged to supply the army with a Salmson combat plane. The machine is expected on July 28, 1920. It has a 240-horsepower motor, 2 gun mounts, a speed of 240 kilometers per hour, and is reported to have cost 18,000 soles.

Italians in Peru, Press Reports.

An Italian-Peruvian aerial navigation company has been organized at Lima with the object of developing aviation in Peru. It proposes to run a regular service between Lima and Iquitos, in the Amazon region, and the starting of further services depends upon the provision of landing grounds and hangars. A flying school will be established near the capital, and the equipment will consist of Caproni machines.

Curtiss Activities.

As previously noted, Mr. C. W. Webster, South American representative of the Curtiss Aeroplane & Motor Corporation, has returned to Lima, where he spent some weeks last year, and has now opened permanent offices at Calle Mineria 103 (altos of the Palais Concert). Reaffirming statements made on the occasion of his first visit to Peru, Mr. Webster says that the Curtiss organization is in Lima to stay.

At the present time the Curtiss organization has an office in Sao Paulo, Brazil, where Capt. Orton Hoover is in charge, and another

office at Buenos Aires, where Mr. Laurence Leon is representing the company. There are now some 13 Curtiss "Oriole" and JN. land planes and 15 Curtiss hydroplanes of the "Seagull" type in Brazil, while in the Argentine there are 5 land machines and 1 "Seagull." A shipment of 10 or 15 more land machines and hydroplanes is on the way to Argentina.

In Peru at the present time there are two Curtiss land machines, a "Standard" and JN., and 6 "Seagulls," owned by the military and naval aviation branches of the Government. Naval aviation headquarters have been transferred to Ancon, where hangars are being built, and the "Seagulls" will shortly be assembled. Capt. Juan Leguia is in command of the naval aviation forces, and has under him the three American pilots, Capt. Simon, Lieut. Reisweber, and Lieut. Mason, and the American mechanics, Messrs. Hall, Jagielsky, and Powers.

Uruguay, Government and Public Interest.

The Uruguayan Government and the public in general have taken considerable interest in aviation during the past few years and, relatively speaking, aeronautics might be said to be advanced in this country. There are, however, no flying machines of any kind manufactured in Uruguay. There are in the Republic two branches of aviation, civil and military.

A popular subscription has been made up among the friends of Capt. C. L. Berisso, of this city, for the purpose of presenting him with an aeroplane. Something over 8,000 pesos were subscribed. It might be mentioned here that the American Association of Uruguay contributed to this fund. A 300-horsepower Ansaldo (Italian) machine, costing 7,000 pesos, has been ordered and will arrive within a few days. Capt. Berisso also desires to obtain a wireless telephone and telegraph apparatus of American make and requested the consulate to telegraph the department for this and other articles needed on the new machine.

Capt. Berisso, who was formerly military attaché to the Uruguayan Legation at Washington, and who has studied at various schools of aviation in the United States, plans an international flight to the capitals of several of the South American Republics and wishes the wireless outfit for use in this raid.

Military aviation.—The military school called the "Escuela Militar de Aviacion" is in Paso Mondoza, about 8 miles from Montevideo. Street cars run about halfway to this field and automobiles and an autobus line carry passengers the remainder of the distance. The school is also connected with the city by telephone.

This school has a rectangular shaped field of about 90 acres with the long axis running north and south. Winds are north until

toward the latter part of the afternoon, when they change to east and northeast. This field is also well suited for the purpose of aviation, as it is well drained, has a comparatively even surface, and has no obstruction whatever. Flying is possible the year round and landings can be made during wet weather. The field is used only for flyers of the military school. Its altitude above the sea is 164 feet.

The military school now owns the following machines:

Five old-type machines now in disuse.

Four Avro biplanes (English), 110 horsepower, equipped with Le Rhone motors, carrying pilot and one passenger, and used for instruction.

Two fighting biplanes (Spad), 220 horsepower, equipped with Hispano-Suiza motors, armed with two Vickers machine guns, and carrying only the pilot. Two other Spads have been acquired by the school and will soon arrive.

Two Breguet machines have been bought but not yet delivered. They are 1917 model machines, 300 horsepower, and equipped with two-machine guns (a Lewis and a Vickers), wireless telephone and telegraph apparatus, and each will be furnished with a camera.

In addition, the military school has purchased eight Vickers machine guns from France. These guns, when they arrive, will be used to arm the Spad machines.

The pay received by instructors in the Uruguayan aviation school consists of their regular salaries plus 100 pesos ($103.40) per month. For instance, a captain receives 135 pesos per month as a regular salary and 100 pesos per month as instructor in the aviation school.

The instructors in the military aviation school are as follows: Director, Maj. Rovira; instructors, Capt. C. L. Berisso and Lieuts. Larre, Ibarra, and Lacosta.

Civilian aviation.—Some time ago the Uruguayan Government donated 10,000 pesos ($10,340) to civilian aviation and now pays 400 pesos ($413.60) per month for its maintenance.

The civil school is situated in Melilla, near Colon, 7 miles north of Montevideo, and its field is open to all aviators. The field is rectangular and measures 4,000 feet by 2,700 feet. The long axis runs northeast and southwest. The prevailing winds are north with an average of 15 miles until toward the latter part of the afternoon, when the winds are east and northeast. The field is well suited for the purposes of aviation, as it is well drained, has an even surface, and has no obstructions near its vicinity. The field is 200 feet above sea level.

There are three pilots in the civil school, as follows: Angel Adami, Uruguayan, having a two-passenger Avro; Esterguy, Argentine, who is shortly to take up another branch of aviation in Argentina;

and Lavidson, Englishman, having a 150 horsepower, two-passenger E. F. machine of 1915 model. The aviation school will shortly receive a new R. A. F. machine (English) of 90 horsepower.

In connection with the civil school of aviation, a club has been organized for the purpose of promoting aviation in Uruguay. The executive committee of the Aero Club consists of 12 members, of which Dr. Cesar Miranda is president, Dr. Berro Garcia, secretary, and Miguel P. Lanata is treasurer. This club enjoys a membership of 150.

There are no maps of the country showing air routes, but landing stations are now being planned over the country and these are shown on specially made maps of the military school.

Weather reports.—The Government maintains two institutes for meteorological observations, one of these institutes being in the central part of town and the other at Suarez, some 3 or 4 miles from Montevideo.

Venezuela Aviation Law.

State regulations of aeronautics were published in the Venezuelan Official Gazette of July 16, 1920.

They comprise—

1. Licensing of airships (and airplanes).
2. Authorization of personnel.
3. Safety of above.
4. Registration marks, etc.
5. Publications.
6. Prohibited zones.
7. Rules of the air, lights, etc.
8. Aircraft from foreign countries.

Foreign activities—English, Italian, German.—There has been considerable activity locally on the part of foreign aeroplane representatives.

A Handley Page representative has been trying to obtain rights and subsidies with the idea of establishing a through aeroplane service between Trinidad and Colombia with intermediate stops at Caracas and other Venezuelan points.

An Italian, Lieut. Cosmo Renella, has been making recent flights in two aeroplanes, a Hanriot and a Caudron. He was brought here by a Venezuelan, Eloy M. Perez, who purchased extra machines in France and hoped to dispose of them to the local government. The local government has not become especially interested, being under the impression that these machines are antiquated.

Manuel Skoble, an Italian, for many years a local resident, has offered new twin propeller Caproni bombers (type Ca 5) to the local

government for 30,000 bolivars ($46,000) each, a very low price. No apparent interest has been shown toward this offer.

A German, Ludwig Hauck, has been trying to interest local officials in the Junker' schen type.

Lieut. Ubaldo Chiaro has been here for some weeks. He has been extremely quiet and as yet nothing definite regarding his advances or intentions is known.

Frank E. Kerdel, representative of the Curtiss Aeroplane Co., is also in Caracas. He seems to be more interested in interesting the local government on the subject of radio equipment than in aeroplanes.

British West Indies.

Handley-Page West Indies (Ltd.) proposed.—An aerial transport service for passengers, mail, and freight between Port of Spain, Trinidad; Tobago, St. Vincent, Grenada, Barbados, Venezuela, and British Guiana, with capital required for its inauguration to be furnished jointly by business men in Trinidad and by the Handley-Page Co. (Ltd.), of England, and with headquarters at Port of Spain, Trinidad, is expected to be in operation by midsummer of 1920.

The machines to be used will be the Handley-Page twin-engine F5 boats, and a company controlling the service in Trinidad will be registered as the Handley-Page West Indies (Ltd.).

Capt. A. E. Thomas, of the Royal Flying Corps of England, is at present in this colony making preliminary arrangements for the above-explained service, and is shortly leaving for Caracas to make arrangements for the establishment of an air service in Venezuela, from Cumana to Puerto Cabello via Barcelona and Caracas, and later Capt. Thomas expects to go on to Colombia to arrange for a service between Bogota and Baranquilla.

REPORT OF LIEUT. LEFRANC, FRENCH NAVY, ON HIS FLIGHT FROM ST. RAPHAEL TO DAKAR—SERVICE REPORT.

Source: Reliable.

(13695.)

30 September 1920.

Purpose of the Flight.

The voyage was intended to determine the possibility of aerial service by hydroplane between France and its colonies in western Africa; to choose the best landing stations on the line, and to study the meteorological, climatic, and atmospheric conditions of the countries over which the flight was to take place. I was to check the

qualities and faults of the type of hydroplane which was given me, and finally I had to test several new apparatuses.

Organization of the Flight.

Choice of route—Supply of stations.—As soon as I arrived at St. Raphael I arranged with Lieut. de Morcourt the organization of the supplies along the Spanish coast for his airplanes and mine which were destined to Morocco. On September 20 I wrote to the vice admiral, requesting that a trawl boat be sent with supplies to the following points: Rosas, Tarragona, Valencia, Santa Pola, Almeria, and Malaga.

The trawl boat *Coccinelle* was sent and organization for the ground stations made by an officer of Lieut. de Morcourt's squadron. For my route beyond Morocco I sent supplies and parts to Kenitra and requested the chief of the Moroccan naval division to send supplies to Agadir and Luz des Canaries.

The "G. L." hydroplanes put at my disposition could only, in addition to all the material necessary for a long flight, take fuel and oil for six hours. In order to arrange for flights lasting less than six hours I was compelled to land for a short time at Agadir, where the roadstead is bad, and then leave the coast and fly to the Canary Islands.

I selected Luz for landing as I recalled that it was a good port, which is true for boats but not for hydroplanes. Then I was to stop at Rio de Oro and at Port Etienne. I requested the port commander of Dakar to send supplies to Port Etienne and one of his towboats to Rio de Oro where there is no telegraph or wireless. I intended to telegraph from the point of departure to the next station the probable time of our landing, as well as the time of our departure, so that the two stations would be informed, and in the event of trouble they could make searches.

Preparation of the hydroplanes.—I was authorized to take at St. Raphael two hydroplanes "G. L." with dual control and capable of 12 hours' flight. I chose the *G. L. 390* and *400* for the quality of their hulls, which were made of Russian birch wood. But I realized that these machines were not ready for long flights, for the following reasons:

1. They could carry a supply of gas for 12 hours, but a supply of oil only for five hours, thus necessitating the installation of an additional reservoir on the upper wing.

2. It was necessary to reinforce the hull at the couplings and partitions, and the base had to be doubled and riveted.

3. The motors had to be demounted and inspected. They were constructed by the Consortium and bear the numbers 18361 and 18287; the latter was replaced.

4. The exhaust pipes were of the ordinary type which burn in a few hours. I had others made, with double wall, fastened by two small bolts instead of one which was burnt by the flames at the outlet.

5. I found that the propellers had not been selected. After several tests I took the propellers Lesseure for 300 horsepower, and with them I gained an average of 5 knots.

6. The seat of the two pilots was so narrow, and the dual control took so much space that I could not install the wireless apparatus.

The available personnel at St. Raphael was not sufficient, and I thus lost more than two months in preparing the hydroplanes for the flight.

Analysis of the Flight.

Our first flying test with the two hydroplanes was made on November 24, going from St. Raphael to Toulon where we stayed two days to make the final preparations. On November 28 we left Toulon for Tarragona. The squadron was composed as follows:

On the *G. L. 400:* Lieut. de Vaisseau Le Franc, pilot; Chief Mechanician Rouhaud, second pilot.

On the *G. L. 390:* Ensign Montrelay, first pilot; Mechanician Pommereau, second pilot.

Passing over Medes with the intention of going beyond Cape San Sebastien, we suddenly met a strong southwest wind which compelled me to return and wait at Rosas for the end of the gale which lasted two days.

On December 1 we took off again and landed at Sagunto to wait for the other hydroplane. I took off for Valencia at 4.45 p. m., in order not to stay at Sagunto for the night, the anchorage being bad at that place. From that moment I was always late because of the other hydroplane which did not succeed in joining me.

Spain.

My opinion is that with a hydroplane of newer type than the G. L., with a larger cruising radius, and with a well-equipped radio apparatus, there is no special need to follow the Spanish coast. From Toulon to Cape San Antonio a good hydroplane runs no risk, for the Baleares Islands show the direction, and, depending on the weather, the pilot may stop at Valencia or at Santa Pola. It would be better not to follow the coast, thus avoiding changes of weather and local storms.

Morocco.

The station of Kenitra, on the Oued Sebou, was forced on me, due to the fact that the naval aviation center is located there, but the

silty steep banks of the river afford no good landing place. Some other better reasons must have been found for choosing that place as an aviation center. In my opinion, the sandy banks of the Oued R'Bla, near Azamor, 35 miles south of Casablanca, would be a better landing place than Kenitra, and would be at a good distance both from Spain and the Canary Islands.

Canary Islands.

If by chance I had taken off three days after my arrival at La Luz, I would have had a wrong opinion of the value of that station from the standpoint of hydroplanes. As I was detained in La Luz for three weeks, my opinion is as follows:

If a hydroplane is compelled to land at the Gran Canaria, it should in no case go to La Luz, but should go to Confital, if the winds blow from northeast or east; or to Gando if the winds blow from the north or northwest.

If the Canary Islands are chosen as a stop between Agadir and Port Etienne, or St. Louis of the Senegal, it would be better not to fly over the center of the islands. In fact, we noticed that between the islands of Fuerteventura, Lanzarote, and Gran Canaria-Teneriffe there was a strong wind and choppy sea. The port of Arrecife is protected by rocks, has a pier with a crane, and is in telegraphic communication with Gran Canaria. Had I stopped there I would have gained three weeks.

Rio de Oro.

The Gulf of Rio de Oro will be a good station eventually. It is safe and well protected. But as the Spanish fort has neither wireless nor telegraph, this station would be chosen only in case of absolute necessity.

Port Etienne.

The roadstead of Port Etienne is good, except with winds from the east, which prevail from February to the middle of March. A stronger hydroplane than the G. L. would find an excellent shelter in the "Baie du Repos" and even the necessary space to take off. If the *G. L. 400* had not been damaged by previous troubles, it would have left Port Etienne very easily a day or two after its arrival.

St. Louis-Du-Senegal.

An excellent station in all seasons. I adopted the southern point of St. Louis Island to cast anchor and receive supplies. There is another good station on the left bank of the Senegal near the bridge of Sor.

From the experience learned on this flight it would seem better to reduce as much as possible the number of stops; to fly as far as possible from the coasts; to proceed from St. Raphael or Toulon to Valen-

cia (Rio Turia) or Santa Pola (supplies from Alicante); from there to the Oued R'bla (Azamor), to Arrecife, Port Etienne, and Dakar.

The pilot should take the most favorable altitude along the Spanish coast, fly over the Straits of Gibraltar near the Moroccan coast, and keep an altitude of 5,000 to 6,000 meters, in order to follow the trade winds from Mogador or from the Canary Islands, depending on the season.

In leaving the Canary Islands it is best to proceed near the coast at Cape Bojador and from there on to follow the shore line, just leaving it to fly over narrow bays. This is not because of the security of that coast, as there are no resources and the inhabitants have of late demanded ransoms from those shipwrecked people whom they have not killed, but because searches could be easily conducted along the coast by boats sent to help aviators in distress.

Remarks on the Flight.

Before proceeding from one station to another, detailed maps should be consulted, together with all other information obtained by pilots who have flown over the region.

All the main landing places of the flight should be marked down on a small board, with their distance from the point of departure indicated, and the information kept at hand with the map holder.

The navigation should be prepared by calculation, by compass bearings, and good lines of direction.

It should be remembered that pilots lose self-control more easily than compasses. This calculation should be trusted, and no arbitrary correction made unless as a result of direct observations. I believe in a change in the route only when the necessity is obvious.

These remarks may seem trivial to my young comrades, the seaplane pilots, but I wish they would remember my advice when they begin to feel nervous as hours pass by with no landfall, and they are apt to choose routes that would lead them very far from their destination.

Advantage should be taken of all possible safety precautions.

The airplane should be equipped with radio—sending and receiving—radiogoniometry instruments, and an antenna with small balloon or kite to send messages while at sea. This last provision is of the utmost importance.

The following maneuvering equipment should be on board:

Grappling irons, folding, weighing 16 to 20 kilogs, aviation type.

A steel cable, supple, of 35 to 40 meters.

A floating anchor, regular type.

A towing belt fixed on the cabin, which passes under the nose of the hydroplane and is used for maneuvering in the ports.

Under the tail a strap which facilitates maneuvering in ports.

A ratline cord, with small sandbag, used as heaving line. The above equipment permitted 40 maneuvers in ports without trouble.

Hoods for the motors and exhaust pipes and covers for the magnetos and propellers should be taken on board. The glass gauge for gas should be inspected. The "Venon" self-starter was very efficient, and seems to be the best at present. In order to avoid trouble it is necessary to keep the inlet system absolutely tight.

In opposition to current ideas, I believe that the initial temperature is not of great importance in establishing the temperature of the flight, which is an average between the temperature of the surrounding atmosphere and the temperature of the circulation around the motor. At the end of April, 1919, on the thermic equator of the world, and in the winter of 1919–20 we had no difficulty, provided we covered the motor with a hood which could be removed according to the temperature.

Meteorology.

My trip from St. Raphael to Dakar emphasized the uselessness of all theories which are not established on direct observations.

Along the Spanish capes of San Sebastien, San Antonio, and Palos I found local winds, but no one knows as yet how far these winds extend out to sea.

It has been ascertained that the trade winds blow to a height of a few hundred meters, and above them are winds from an opposite direction, called return-trade winds. I sometimes found the latter at a height of 800 meters, and at other times at 2,000 or 3,000 meters I did not find them.

The laws concerning the origin, height, and speed of the squalls—called tornadoes in western Africa—should not as yet be fully trusted, for these phenomena need still to be carefully investigated.

As a result of these conditions, several observation stations should be established and connected by radio. I expressed this idea at Las Palmas and at La Gran Canaria, and the necessary funds were at once allotted by the "Escuela Industriela," of which the director is Dr. Mascareinas. This station should be connected with our radio stations in Morocco and at Port Etienne.

To each of our radio stations in western Africa, Port Etienne, Bamako, and Timbuctoo, should be sent material necessary to make soundings. All information would come to Dakar and could be sent by the radio station of Rufisque.

Technical Remarks on Material.

Important changes have been made to the hulls, which have been reinforced with laminated wood.

No modifications made on the wings.

Magnetos "SEV" replace "Gibaud."

A propeller "Leseurre" was adapted instead of a "Lumiére."

The Renault motor worked very satisfactorily during the entire trip. It is very regular, although rather slow to come up to speed. It requires constant and careful supervision.

The Claudel carburetors and the A. M. pump proved to be satisfactory.

Navigation Devices.

(*a*) The marine maps are useless. They are even inaccurate from Morocco to Senegal.

(*b*) The nautical instructions (Notice to Mariners) are not up to date. They do not show the *Kaiser Wilhelm Der Gross* wreck at Rio de Oro and two wrecks ashore north of Port Etienne. One of them is called *La Marie.* A large Moorish village at Cape Mirik is not indicated. The exact situation of the Tidra Islands is on an area of 40 miles from north to south of Cape Mirik.

(*c*) The two compasses, Kelvin-Batternley and Baird (Ltd.), Glasgow, and the other, Hughes (Ltd.), London, registered only normal changes.

(*d*) The watches of Allion, Versailles, are good.

ACTIVITIES IN COMMERCIAL AVIATION OF JAPAN.

Source: Reliable.

(9318.)

30 September 1920.

Résumé.—Fifty students to be trained at Tokorozawa; 50,000 yen granted by Government annually, for training of volunteer air force; new school at Nahashima, Gunma Prefecture; new air mail services.

With a view to the organization of the volunteer air force, the aviation bureau in the war office has decided to train 50 students.

According to the authorities concerned, these students will be admitted into the aviation school, Tokorozawa, after the physical and other examinations, and will be trained for a period of nine months in the art of controlling aircraft.

"The present training of civilian aviators has for its object the organization of a volunteer aerial force in time of emergencies," says Maj. Gen. Hata, vice chief of the aviation bureau to the Tokyo Asahi, and for this purpose the Government has decided to grant annual subsidies of 50,009 yen, which will be mostly devoted to the construction and study of aeroplanes.

Another civil aviation school will be open on November 1 by the Nakashima aircraft workshop in Gunma Prefecture, with Lieut. Mizuta as principal. Mr. Satch, a notable civilian aviator, will make a mail flight on October 15 from Niigata to Mikawa at Sado Island, and on the following day between Kanazawa and Toyama.

Preliminary investigation of a regular air-mail service route from Tokyo to the Bonin Islands will be made soon by Mr. Isobe, civilian aviator. The service is considered to be of paramount importance from both the strategical and administrative standpoints.

From current reports it is to be expected that the aerial mail service between Yokohama and Tokyo will be an accomplished fact in the not distant future.

NAVAL AVIATION IN JAPAN.

Source: Reliable.

(9318–E.)

22 September 1920.

Naval aviation compared with army aviation is less advanced with respect to the state of training of personnel and in construction. However, navy personnel is much superior to army personnel, especially the mechanics.

There is one battalion group at Yokosuka, one group (embryo) at Kure, and another such group at Sasebo. There is a school and aerodromes at Yokosuka, for both aeroplane and balloon.

The following hydroplanes are in use:

Shortt.	Tellier.
Sopwith.	Yokosuka.

This last type (Yokosuka) is a reconnaissance plane, manufactured in Japan, and is believed to have a 76-horsepower motor.

In a recent interpellation in the Diet, the minister of the navy stated that the navy possessed 112 planes. Japanese newspapers state that the navy intends to increase the air force to 17 groups within the near future.

Just what constitutes a group is not as yet certain, but in any case it means a great increase over the present strength.

The Yokosuka type referred to above is no doubt the same one referred to in my report on Yokosuka naval station forwarded in this mail.

From questions asked me by A. D. C. to the minister of marine, I am convinced that the subject of combining the air forces of the army and navy is now under discussion.

Another question that seems to be causing the navy department considerable worry is what to do with officers of the naval air service after they have passed the flying age. I believe they do not look with favor on these officers coming back into the line, and they are convinced that there will be many such officers in excess of the administrative requirements for the air service.

FIGHTING SEAPLANES CONSTRUCTED FOR DUTCH NAVY BY FIRM OF VAN BERKEL, ROTTERDAM.

Source: Reliable.

(13561.)

4 October 1920.

DATA ON TESTS OF VAN BERKEL'S SEAPLANES.

Information has just been received from the firm of Van Berkel, Rotterdam, that flight tests have been made with their new fighting seaplanes.

The results of these tests were as follows:

Fully loaded, speed 109 miles per hour.

Length of time of run before getting off water, 20 seconds.

Climb to 1,000 meters in 6½ minutes.

Fuel capacity, 7 hours at full throttle.

Total load carried, 2,100 pounds.

It is estimated that if low compression Liberty engines were used in these seaplanes instead of Rolls Royce Eagle VIII engines the performance would be:

Speed, 104 miles per hour.

Climb, 1,000 meters in 7½ minutes.

The firm of Van Berkel has just purchased the patents of the Zeppelin metal aeroplane constructors (Dornier) and is now prepared to build all metal machines.

APPROPRIATION FOR NAVAL AND MILITARY AVIATION, 1920–21, ITALY.

Source: Reliable.

(11741.)

4 October 1920.

For the present fiscal year ending 30 June, 1921, the following appropriations have been made for aviation:

Navy	lire	4,000,000
Army	do	10,000,000

These appropriations do not include the pay of regular army and navy personnel employed, but from them must be paid the civilian experts and laborers and all other expenses of construction, development, and operation.

ZEPPELIN "L–61" IN ITALIAN NAVAL AIR FLEET.

Source: Reliable.

(4856–B.)

11 October 1920.

The Zeppelin *L–61*, ceded by Germany to Italy, has reached Rome and has been entered in the Italian Navy Air Fleet. The Zeppelin is now known as the *Italia*.

ENGINEERING.

ENGINE TYPES FOR MOTOR SHIPS—2-CYCLE OR 4-CYCLE?

Source: Reliable.

(13711.)

19 October 1920.

The increasing use of the Diesel engine for the propulsion of all kinds of ships, especially at the present day when there is such a boom in shipbuilding, has made the question as to whether the 2-cycle or the 4-cycle system should be used of still more interest and importance.

There is no doubt that general opinion until lately was in favor of the 4-cycle, as this had certainly been used with success in merchant ships, and credit must be given in the first place to the Danish firm, Burmeister & Wain, for their work in producing a reliable 4-cycle marine engine. Other important firms on the contrary have regarded the 2-cycle system right from the beginning as the system par excellence for marine engines. But it must unfortunately be acknowledged that the early 2-cycle engine, in all its various forms, was nearly always more or less of a failure and could not compete with the 4-cycle engine with any hope of success. To-day, however, the situation has entirely changed.

The firms making the first Diesel marine engines had all had many years' experience in the building of 4-cycle machines, but few of them had had any experience with 2-cycle engines. Many yards and engineers neglected to carry out sufficient experimenting and built their first engines, with all their inherent defects, direct into the ships, so that it is scarcely to be wondered at that no great success resulted. Some builders even went so far as to construct double-acting 2-cycle machines before they had been able to overcome the difficulties presented by the single-acting engines. The natural result of this haste was, of course, the creation of a prejudice against the 2-cycle engine and consequent delay in the evolution of this system; to this prejudice must undoubtedly be attributed the preference given by shipowners and shipbuilders to the 4-cycle engine, and the distrust with which they regarded the 2-cycle.

The difficulties at first experienced with air compressors, fuel pumps, crosshead slides, piston cooling, forced lubrication, etc., and

which formerly caused a great deal of trouble, may now be said to be things of the past; the 2-cycle engine has been developed into an ideal engine for marine purposes.

The difficulty in building a 2-cycle engine does not lie so much in the actual construction of the machine as in *the choice of the right 2-cycle system.* The development of the 2-cycle Diesel engine required much preliminary experimenting at a considerable cost in time and money, and also called for the exercise of a large amount of patience and perseverance, so that it is not surprising to find that many firms gave up the 2-cycle without attaining any definite results. Unfortunately during the war there was no opportunity of making public the facts and figures as to the progress which had been made with the 2-cycle engine. To give an idea of the headway which this system has really made, it may be mentioned that up to the middle of 1919 over 300,000 horsepower of Sulzer-Diesel 2-cycle engines alone had been delivered or were in course of construction.

The greatest difficulty—that of the heat *cracking of the cylinder heads*—can only be eliminated by doing away with the scavenging valves in the cylinder heads and providing ports in the lower part of the cylinder. Messrs. Sulzer Bros., of Winterthur, were the first to do this, and it is thanks to their patented system of scavenging that these difficulties have been eliminated.

The following criticism, with facts and figures, of the Sulzer 2-cycle system and the 4-cycle system will allow of a comparison being made between them.

The principal factors to be taken into consideration in the design of marine engines are:

1. Simplicity of construction and reliability in working.
2. Economy in working.
3. Ease of reversing.
4. Accessibility of all parts for overhauling, etc.
5. Space required.
6. Weight.
7. Initial cost.

We shall now compare the Sulzer 2-cycle with the 4-cycle and see in how far each of them conform to these requirements.

Simplicity of Construction; Reliability in Working.

The principal part of a Diesel engine on which its reliability depends is the combustion chamber and its surroundings, including the valves.

During the working process the combustion chamber has to stand temperatures up to 3,500° F. and pressures up to 650 pounds per square inch. It is clear that under such circumstances the cylinder head, cylinder liner, and the piston are subject to very severe strains.

The piston and cylinder liner give comparatively little difficulty. as they are round bodies, with the metal everywhere of a comparatively regular thickness, thus permitting of an easy and fairly even expansion; the most serious trouble is offered by the cylinder head, where the inevitable holes for the valves increase the danger of heat cracking, and it is not probable that this trouble can ever entirely be eliminated. The danger here is especially great in the case of the 4-cycle engine, but it is also serious enough for 2-cycle engines constructed with the scavenging valves in the cylinder head.

But in the last system, in addition to the danger from the actual holes for the valves, there is also the further risk of the valves themselves causing trouble by reason of the high temperatures and pressures which they and their springs have constantly to stand.

In the Sulzer 2-cycle engine the scavenging is done through ports from below, and there is only one hole in the cylinder head to take the combined fuel and starting valve.

The following table shows the number of valves required in the *combustion chambers* under each system for the main engines of a twin-screw steamer:

System.	Number of valves per cylinder.	For one ship (twin-screw).	
		Number of valves.	Total of holes in the cylinder heads.
Sulzer 2-cycle with scavenging from below (4 cylinders).	1 fuel valve, 1 starting valve.	16	8
2-cycle with scavenging valves in the cylinder head (4 cylinders).	1 fuel valve, 1 starting valve, 2 to 4 scavenging valves.	32–48	32–48
4-cycle (6 cylinders).....	1 fuel valve, 1 starting valve, 1 inlet valve, 1 exhaust valve.	48	48

From these figures it is perfectly clear that *in simplicity and reliability of valve gear the Sulzer 2-cycle is by far superior* both to the 4-cycle and to the 2-cycle with scavenging valves in the cylinder head.

A particularly weak point in large 4-cycle engines is the exhaust valves. These valves keep in good working order as long as good gas oil is used and as long as the mean effective pressure in the cylinder is kept so low that the temperatures are never excessive; but as soon as the engine is on full load and if a fuel containing, for example, sulphur or asphalt is employed, these valves quickly become defective and leaky and often so hot that the metal is seriously

weakened and parts fall into the cylinder, causing complete breakdown. A leaky valve also causes loss in compression, and consequently inefficient working of the cylinder it is controlling, throwing a corresponding overload onto the other cylinders whose valves are working properly. The consequence of this is that these cylinders in their turn also suffer; they become quickly incrusted with soot, and the cylinder heads, which are not easy to cool, are rendered still more liable to crack. If it is necessary to continue running on a bad oil of that kind, a large stock of spare parts must be carried, and the constant changing of the parts and the turning and grinding of the exhaust valves will cause a big loss in labor and time and inevitably a much longer voyage.

While in the Sulzer cylinder head there is but one opening, and that central, in order to receive the common cage of the fuel and starting valves in the 4-cycle system there are four openings necessary (in some systems even five) for the admission, exhaust, fuel, and starting valves. As regards cooling and simplicity of casting, the Sulzer type of cylinder head is far superior to the others. Being perfectly circular, without any uneven distribution of metal and without ribs, it can expand uniformly in every direction, so that it may be said with confidence that *only the Sulzer cylinder head offers any guaranty against heat cracking.*

It is clear that such a cylinder head is able to stand high mean temperatures without any damage, and, as a matter of fact, a number of engines are known to have been running for several years on bad fuel and at a mean indicated pressure of 100 pounds per square inch without a single breakdown. On the other hand, experience with large 4-cycle engines, where the cooling of the cylinder heads is a difficult matter, is quite different. In order to lengthen the life of the heads as much as possible, the mean indicated pressure is reduced during the voyage to 80 to 85 pounds per square inch, and it is generally thought good enough if a mean pressure of 90 to 100 pounds per square inch is obtained during short trial runs.

Data has been published on the motor ship *Peru*, one of the latest boats to be fitted with Diesel engines. During the trial run the mean indicated pressure reached a maximum of 97 pounds per square inch, giving a speed of 12.74 knots. As the normal contract speed is 11.2 knots, it follows that the normal power, when in actual service, must be correspondingly lower and that the mean indicated pressure is not likely to be more than about 85 pounds per square inch. A further publication dealing with the motor ship *Annam*, also fitted with 4-cycle engines, gives the mean indicated pressure as only 82 pounds per square inch. The American periodical Motor Ship of August, 1918, states that the mean effective pressure of the 4-cycle engines of Messrs. Macintosh & Seymour and of the "Skandia" ship-

building yard average only 63 pounds per square inch, corresponding to a mean indicated pressure of about 83 pounds per square inch.

It has also been recorded that the temperature of the exhaust gases of the engines of the motor ships *Sebastian* and *Juno* when running at normal speed is about 700° F., and as the exhaust temperature of 4-cycle engines at full load is known to be about 780° F. we have here proof that also these engines were running at reduced mean pressure. Engines whose design is based on such low mean pressures must be large and heavy and out of all proportion, and so in this respect are far inferior to the 2-cycle machines. With equal cylinder dimensions and equal piston speed, a 2-cycle engine will give at least double the power of the 4-cycle, and the 4-cycle engine must therefore be run at a higher speed if it is to develop approximately the same power as a similar 2-cycle machine. It is therefore usual to find that 4-cycle engines work at a higher speed than 2-cycle machines of the same size. This naturally leads to increased wear and tear and to propeller troubles; there is greater vibration and balancing is more difficult. The efficiency of the propeller is impaired by the higher speed and this alone is sufficient to condemn it.

All the above-mentioned troubles with cylinder heads and valves become greater the more the diameter of the cylinders is increased. The 2-cycle is in this respect at an advantage over the 4-cycle, as for equal power it always requires a much smaller cylinder diameter and therefore a smaller cylinder head. Whatever design may be chosen for the 4-cycle cylinder head, there is no getting away from the fact that the four valve holes which weaken it must be there.

It must also be mentioned that a 2-cycle engine with only four cylinders has a *much more even turning moment* than a 6-cylinder 4-cycle engine. Vibration is therefore lessened and the efficiency of the propeller is raised.

Economy in Working.

As the principal factor affecting the cost of working is the price of the fuel, it is necessary to endeavor to use the cheapest possible. The view that Diesel engines can be run only on crude oil distillates is no longer held. Without difficulty the Sulzer 2-cycle engine of to-day works on Californian and Mexican crude oils of high sulphur and asphalt content, oils which were hitherto exclusively used for firing boilers. The 4-cycle is not suitable for running with such oils as the asphalt and the sulphur which are always present in this class of fuel attack the exhaust valves badly and render them leaky in a very short time. All merchant ships fitted with 4-cycle engines now run on gas oil, although it is exactly this class of ship that requires engines that are not particular as to the quality of the fuel supplied them. These ships when in out-of-the-way parts of the world have

to be content with fuel of all sorts of varying qualities. It is also to be anticipated that in the future Mexico and California with their cheap crude oils will be the chief suppliers of the world's markets, and for this reason alone preference should be given to the 2-cycle. Another kind of fuel which can only be used in the 2-cycle engines is tar oil, as they can use it without any admixture of gas oil. The larger 2-cycle engines can even reverse on pure tar oil and only require gas oil for starting up.

A clear distinction must be made between the fuel consumption per indicated horsepower and per effective (brake) horsepower, especially when comparing 2-cycle with 4-cycle engines. The effective horsepower at the shaft is what is of account, as here the only question is as to the amount of power available for the propeller.

Fuel Consumption.

To say that the fuel consumption of the 2-cycle engine is higher than that of the 4-cycle is only to a limited degree true to-day, and, as the following remarks prove, this opinion can certainly no longer be upheld in the case of merchant ships. The fuel consumption of a first-class 6-cylinder, 4-cylinder engine with piston cooling and running at full load on gas oil of a minimum calorific value of 18,000 B. t. u. per pound, is 0.408 pound per brake horsepower hour under the most favorable conditions: this includes the power for the pumps circulating the necessary cooling water for the cylinders and pistons and the power for the oil pumps. Consumptions under 0.4 pound have been occasionally recorded on test bed trials of smaller engines without cooled pistons and with separate auxiliary pumps, but in these cases the calorific value of the fuel was generally over 18,000 B. t. u. But, as we have seen above, the 4-cycle engine, in order to save the valves and cylinder head as much as possible, makes the voyage at a mean pressure of only about 82–85 pounds per square inch, and there is consequently a corresponding increase in the fuel consumption; experiment has shown this increase to be 3 to 4 per cent, and, allowing for this, the fuel consumption works out at about 0.42 pound per brake horsepower hour. The publication on the motor ship *Annam*, already referred to, gives the mean fuel consumption for the voyage as averaging 0.421 pound per brake horsepower hour.

By the adoption of the Sulzer system of scavenging in the 2-cycle it is possible to work at a very low scavenging pressure, so that the work demanded from the air pumps is reduced to a minimum. In the larger installations, where large electric-driven turbo blowers are used as scavenging air pumps, the power absorbed is still lower.

A Sulzer 2-cycle engine working its own air pumps requires about 0.418 pound of fuel per horsepower hour. If independent scavenging

pumps, viz, turbo blowers, be used, then the consumption of fuel, including that required for driving the auxiliary machines for the blowers, comes to 0.414 pound per horsepower hour.

There is therefore practically no difference in fuel consumption between the larger sizes of 4-cycle and 2-cycle engines. But, on the other hand, it must be noted that the speed of the 2-cycle engine is a good deal lower than that of the 4-cycle, and the consequent increase in propeller efficiency is at the very least 1 to 2 per cent. The above considerations, therefore, fully justify the claim that in merchant ships *the fuel consumption of the Sulzer 2-cycle engine is the same as that of a 4-cycle.*

The adoption of turbo blowers is always to be recommended where electric power is also required for winches and other auxiliary machinery, as is now practically the rule on a modern Diesel boat.

An article published in Motorship (New York, October, 1919), shows that in the latest 4-cycle engines of about 2,000 indicated horsepower the mean indicated pressure has been reduced to 5.3 kgs/cm^2 (about 75 pounds per square inch). It goes without saying that the consequence of such reduced mean pressure is a lower mechanical efficiency. As a result of carefully studied tests it has been clearly proved that the 4-cycle can only reach the maximum efficiency of 77 per cent at a mean pressure of 8 kilograms (114 pounds); at a pressure of 5.3 kilograms (75 pounds) the efficiency is only about 67 per cent. Even supposing it to be 70 per cent, the above mentioned 2,000 indicated horsepower 4-cycle engine, for which the manufacturers guarantee 140 grams per indicated horsepower has a fuel consumption of 200 grams (0.44 pounds) per brake horsepower, which is fully 5 per cent higher than in a Sulzer 2-cycle engine of that power.

The driving of the turbo blowers requires a relatively large amount of electric energy compared to the other auxiliary machines, but as this load is constant there is no difficulty in supplying from the same source the energy required for lighting the ship, for the steering gear, and for any heating and cooking required; a special unit for electric lighting is therefore not necessary.

When in port the same dynamos supply current for the winches and, being of fairly large size, one dynamo is sufficient in every case to supply the current necessary for the whole work of the ship, while the second machine, or possibly even a third, is there as reserve; ample insurance against any interruption in the handling of the cargo through failure of the supply of electric energy.

This arrangement has the further advantage that the whole plant, main engines and auxiliary, are subject to practically equal wear, but when the scavenging air pumps are driven directly by the main engine the auxiliary engines are in use for a comparatively short

time, working only in port while handling the cargo. In larger Diesel plants the adoption of separate drive for the scavenging air pumps has the further advantage that the cylinders of the main engines can be of a smaller dimension than would otherwise be necessary. The scavenging pumps in submarines can be further employed in regulating the supply of air to the ballast tanks when submerging and when rising to the surface.

Consumption of Lubricating Oil.

The consumption of lubricating oil is about the same in both systems and varies between 0.8 and 2 grams (0.002 and 0.007 pound) per horsepower hour, according to quality and the attention given by the engineers.

In consequence of its higher cylinder temperature, the 2-cycle system requires a somewhat more liberal cylinder lubrication than the 4-cycle, but on the other hand there are no admission and exhaust valves to be lubricated, to say nothing of the absence of gears for these valves. A large saving is effected here, as it is quite possible for the consumption of lubricating oil in the exhaust valve alone to amount to quite a significant figure, owing to the losses there by evaporation from the overheated metal.

Large power machines have always six or eight cylinders in the 4-cycle system and, as a rule, only four in the 2-cycle; consequently the former has a much greater number of bearings and working parts which require lubrication. Besides that, the speed is higher than in the 2-cycle engine, and on the whole it can be said that in large installations the lubricating *oil consumption of the 2-cycle engine is more favorable* than that of the 4-cycle.

Ease of Reversing.

Absolutely certain and reliable reversing is one of the chief qualities to be looked for in every marine engine. It must readily start ahead or astern, as desired, and at any position of the crank shaft, and this can only be attained when there is always one of the cylinders in a position to receive starting air. In a 4-cycle engine this is only possible when there are six cylinders; if there were less than six it would be necessary to start on the 2-cycle system, which would entail such a complicated system of valve gearing as to make it practically impossible. On the other hand, a 2-cycle engine with four cylinders is readily reversible, corresponding to a 4-cycle machine with eight cylinders. It also requires much less *starting air than the 4-cycle*, as the cylinders are fewer in number and smaller in size, and consequently offer less frictional resistance.

It is easy to understand that the reversing gear of a 2-cycle engine, and especially of the 2-cycle Sulzer engine, is much simpler than that of any 4-cycle machine, as there are only two valves per cylinder, in-

stead of four, which have to be reversed. If we assume that the reversing is done in both cases, 4-cycle as well as 2, by means of cams, as in the Sulzer system, then we would have in a twin-screw ship a total of 96 cams for the 4-cycle engines, as against 32 only for the Sulzer 2-cycle machine.

Two-cycle engines with scavenging turbo-blowers are specially good starters and reversers, firstly because no reciprocating air pumps have to be worked by them, and, secondly, because the warm scavenging air supplied by the independent blower is already at such a pressure at the first revolution of the main engine that it insures the first upward stroke producing the necessary compression in the cylinder for proper ignition to take place.

Such machines have reliable ignition, even at low speeds, as the scavenging air pressure is not thereby reduced, and consequently the compression pressure is but slightly less than at full speed. From the foregoing it is seen to be incontestable that in starting and reversing the 2-cycle is far superior to the 4-cycle.

Accessibility of Parts.

It is of the greatest importance that in case of trouble every single part should be capable of being quickly and easily repaired and that defective or broken parts should be easily replaced by spare parts of an exact fit. In the 4-cycle, with its multitude of spare parts, valves, cams, springs, and the like, it is not so easy to comply with the above conditions as in the 2-cycle, which requires a much smaller stock of spares.

The cylinders and the other parts of a 2-cycle engine are much lighter and smaller than those of a 4-cycle engine of equal power, and, in consequence, any necessary overhauling or repair can be carried out much more easily and quickly than in the case of a 4-cycle; also the dismantling and refitting of the heavy exhaust and suction piping is done away with entirely. Seeing that the appliances on board ship for carrying out any extensive repairs must always be of a more or less primitive character, it is clear that the 2-cycle, with its great simplicity of design, is at a great advantage over the 4-cycle; every single part, and especially the valve gear, are much more accessible.

Space Required.

The space requirements of 4-cycle and 2-cycle engines of equal power for the same ship are much less for the latter type of engine.

The engine room of a 2-cycle plant is much shorter than that of a 4-cycle, because of the few cylinders required.

Weight.

Makers of 4-cycle engines are as a rule careful not to publish data concerning the weight of their plant, as the figures would com-

pare very unfavorably with the weight to the corresponding sizes of 2-cycle machines, but it is naturally easy, when the dimensions of the machines are known, to calculate their weight approximately.

Initial Cost.

We have seen that the 2-cycle plant is much simpler than the 4-cycle; it has less gear, smaller dimensions, and therefore less surface and parts requiring machining, and the total weight is only 60 per cent of the 4-cycle. It is therefore clear that the cost of a 2-cycle plant is much smaller, and a still further saving of money is made in the account for spare parts.

Comparison of a 4-cycle and 2-cycle plant for a twin-screw ship.

System.	Four-cycle.	Two-cycle.
Main engines:		
Normal power.....B. H. P..	2×1,100	2×1,100
Speed.....R. P. M..	125	105
Mean indicated pressure....pounds per square inch..	84	94.5
Number of cylinders.....	2×6=12	2×4=8
Bore.....inches..	$24\frac{3}{4}$	22
Stroke.....do....	$37\frac{3}{8}$	$32\frac{5}{8}$
Volume swept by pistons per engine.....cubic feet..	$62\frac{1}{2}$	$30\frac{3}{4}$
Auxiliary Diesels:		
Power.....B. H. P..	3×90=270	2×300=600
Speed.....R. P. M..	300	200
Number of cylinders.....	3×2=6	2×4=8
Bore.....inches..	$12\frac{1}{4}$	$12\frac{3}{4}$
Stroke.....do....	$13\frac{3}{4}$	$19\frac{3}{4}$
Total number of valves of main and auxiliary engines....	72	32
Number of valves working in the combustion space:		
Fuel valves.....	14	12
Valves.....	28	None.
Total.....	42	12
Weight of complete plant.....tons..	[1] 530	[1] 320
Weight per brake horsepower.....kilograms..	240	145
Length of engine room.....meters..	15	11
Gain of space for cargo .....cubic feet..	.....	30,000
Saving in weight of plant.....tons..	.....	210
Diameter of crankshaft according to Lloyds' Regulations.....inches..	15	$13\frac{3}{4}$

[1] About.

ORDNANCE.

JAPANESE TORPEDOES.

Source: Reliable.

(5335.)

22 September 1920.

All Japanese torpedoes are Whiteheads, both 18-inch and 21-inch. They have never experimented with turbine torpedoes.

Submarines are equipped with 18-inch torpedoes, destroyers and battleships with 21-inch. One officer stated that the torpedoes used by submarines were shorter than standard 18-inch torpedoes and had heavier heads. This does not seem to be so, as all 18-inch torpedoes and submarine tubes being manufactured at Yokosuka were full length. The 18-inch torpedoes being manufactured at Yokosuka were apparently identical with our own Whitehead Mark V, Model IV, except gyroscopes. The valve group, the regulator, the pistol, the fuel and combustion flasks, the hydrostatic piston, and pendulum were the same as our Mark V, Model IV. The gyroscope is similar to the Obrie gear but of somewhat heavier construction, especially at the wheel pivots and ball bearings. It is an air-impulse and a continuous-impulse (by air) gyroscope. All gyroscopes are adjusted by spinning; balancing has never been tried. It is stated that much trouble is caused by soft pivots and chattering relay valves. The same gyroscope is used in all torpedoes.

The 21-inch torpedoes were reported to use superheated steam, fuel being gasoline.

Apparently no attention is paid to speed of torpedoes, hits being the only thing that counts. The consensus of opinion was that at 10,000 yards the best speed to be expected was between 26 and 24 knots, the average speed for this range being around 18 to 20 knots. It was stated that many torpedoes make only 8 to 10 knots at 10,000 yards. They stated, however, that as the range decreases to 7,000 yards the average speed increases rapidly.

Battleships are required to fire at 10,000-yard ranges. Destroyers have previously fired at 7,000-yard ranges, but their ranges are now being increased. The submarine range was not ascertained.

A great deal of torpedo firing is done, especially by destroyers.

The total number of battleship torpedo practices held yearly was not learned, but they do have one practice, called training practice,

at 10,000 yards, stationary target, 200 meters long. It was estimated that 50 per cent of hits are made at this practice.

Destroyers have three annual practices, namely, training, day tactical, and night tactical. The training practice has previously been at 7,000 yards range, stationary target, 200 meters long. All torpedoes are fired, percentage of hits unknown.

The day tactical practice is also 7,000 yards, moving target, 600 meters long. The target is sometimes a towed one, but usually consists of three destroyers in line ahead, the center destroyer being point of aim, the end boats the limit of the target. The firing is by divisions, usually three boats (sometimes more). The division stands down the range in line ahead; all discharge simultaneously by signal the entire broadsides of torpedoes, then turn toward target and recover torpedoes. Many torpedoes are lost in this practice, due to confusion and difficulty in following same when there are so many in the water. The results of this practice as regards hits are unknown.

The night tactical practice is also conducted by divisions, and approach is made in same manner as in day tactical practice. The target is a battleship under way; course, speed, and range unknown. The firing is done simultaneously by signal, but each ship in the division fires only one torpedo. Almost all torpedoes fired in this practice are lost. Percentage of hits obtained is unknown. Collapsible heads are used in both day and night tactical practice. All torpedoes are fired from the bridge by bridge director.

One is led to believe, as a result of conversations with various officers, that the annual loss of torpedoes is so great that it is a very serious problem.

JAPAN, EFFICIENCY IN GUNNERY.

Source: Reliable.

(402.)

16 October 1920.

1. As a general policy the Japanese have endeavored to obtain from the British one model of each new naval gun and its fittings and one model of each new fire-control instrument. From these models they have made imitations with which the majority of their homemade ships are fitted.

2. In carrying out this policy they have had to contend with several factors that materially reduce the actual efficiency of their fire-control as compared with the navies of the big powers. These factors are as follows:

(*a*) The British reserve their best material for their own exclusive use, and Japan, as a general rule, gets the next best.

(*b*) In imitating high-grade material the Japanese can not afford, and sometimes can not produce, the same quality. Their own officers admitted that their naval appropriations were too small for the size of the programs that have been projected, and that as a result there was a tight squeeze in all departments. This seems logical, as one of the national traits is to imitate everything on a lighter and usually inferior scale.

(*c*) In attempting to imitate the workmanship necessary in high-grade instruments they suffer everywhere from shortage of *highly* skilled workmen.

(*d*) In operating fire-control instruments they excel in the small details, where constant practice could produce efficiency. With collective fire control and teamwork in the ship's organization there is, however, room for great improvement before they can be favorably compared with the fire control of the British Navy.

3. According to the opinions of some British officers, it was considered that as a result of these four detracting influences that the Japanese gunnery on these battle cruisers could only be considered as efficient as prewar British gunnery and that *the Japanese were about six years behind the British in fire control.* They may have underestimated the general efficiency of the Japanese fire control from a knowledge of but one example but there was no doubt, according to the informant but that the Japanese system as a whole did not hold together well.

4. The observers were permitted to enter the turrets and witness the firing. The loading time was considered a bit slower than for British guns of the same caliber, but the work of the gun crews as a whole was excellent.

5. In the case of small caliber guns the drill observed was also excellent. It seems that crews excelled in every point that could be developed by hard and continuous drill. It was remarked that officers and men "tried hard" to attain efficiency.

6. The large number of observers during practice was remarked upon. They seemed to be everywhere. A particularly noticeable feature of this was an observer stationed alongside the captain and each of the senior officers in the practice. These "personal" observers took down every remark of the officers and noted their relative attitudes of excitement, calmness, etc., in order that the navy department could later study in detail the weaknesses and mistakes of each officer. A somewhat novel and yet trying process.

7. In addition to ships observers, a number of flag officers, that included several retired admirals were present at the practice and witnessed the firing from a vessel detailed for their special use.

8. The fire-control system in use was stated as generally resembling the British director system.

TEST OF ARMORED SHIELDS MADE BY AVESTA JERNVERKS AKTIEBOLAG (THE AVESTA IRONWORKS CO.).

Source: Reliable.

(13634.)

17 September 1920.

On 27 August, 1920, the naval attaché visited the works of the Avesta Jernverks Aktiebolag at Avesta, Sweden, and witnessed firing tests at armored plates used for the protection of riflemen against small-arm fire.

The plates were 450 by 6 millimeters, with a rifle port opening which is closed when not in use by a pivoted shutter of the same material as the plate.

A Swedish Army rifle firing a 7.5-millimeter bullet with a muzzle velocity of 875 meters per second was used. The severest test consisted of seven shots at a range of 10 meters placed in an area of about 4 square inches without penetration. The plate was not cracked and was only slightly bulged.

A single shot fired at an unhardened plate of the same material went through it like a piece of cheese.

I was informed that the bullets used were not the standard Swedish Army type but were a special "torpedo-shaped" bullet made expressly for these tests.

Every individual plate contracted for by the Swedish ministry of defense is separately tested before acceptance by having three shots fired at it at a range of 25 meters. One shot must hit the port shutter, but the other two may be as widely dispersed as the dimensions of the plate permit. If no crack develops the plate is accepted. The rejections are less than 2 per cent.

This seems a very mild and inconclusive test. Psychologically it seems an excellent idea to test each plate, as the evidence of those three dents would undoubtedly give the sheltered riflemen a certain amount of confidence.

At my suggestion the company agreed to ask the Swedish officials to conduct a conclusive test with a Madsen machine rifle, firing to penetration or destruction. The company has promised to furnish me with a report of this test.

TORPEDOES, SPEED OF SHIPS FIRING FROM SUBMERGED TUBES.

Source: Reliable.

(13734.)

29 October 1920.

In the present condition of their underwater tubes the French do not fire torpedoes at a speed above 18 knots because of the abnormal deviations which are produced at high speed.

They utilize entirely spoon tubes for above surface discharge, and firings are effected normally at any speed, notably at 30 knots on board destroyers.

COMMUNICATIONS.

WIRELESS TELEPHONE AND RADIO DIRECTION FINDERS.

Source: Reliable.

(4934–A.)

22 September 1920.

There are no wireless telephones in Japanese men-of-war or merchant vessels.

There are two wireless telephone installations in Japan, one at Kobe and the other near Tokyo.

The installation at Kobe is of uncertain success. Recent efforts to commercialize it so that direct communication could be carried on from land wire telephones through wireless phone to ships in the harbor have failed.

The installation near Tokyo is practically a failure, in that it can not to be used except by first calling over hand wire phone, then shifting to wireless phone.

A new wireless telephone set has been shipped from New York to Japan, but it has not yet arrived.

This failure to have progressed in use of wireless phone is not due to negligence or lack of desire on the part of the department of communications, but due to their inability to procure same.

The wireless telephone is practically controlled by two firms (Western Electric Co. and, I believe, the General Electric Co.). On account of litigation over the patent rights of the vacuum tube (which could not be settled in court, but has practically been settled between the two companies) both companies have repeatedly refused to sell to the Japanese Government, and consequently the department of communications has been forced to attempt to manufacture its own vacuum tubes; but this attempt has been almost completely devoid of success.

In connection therewith it is of interest to note that whereas the portable field wireless phone set used during the recent war was a compact affair that could be carried by two men, the Japanese set, after several years of experiment, is of about the following dimensions: 15 feet long by 6 feet wide by 4 feet high.

There are no radio direction finders installed in either ships, airplanes, or shore stations.

BRITISH CABLE, COCOS ISLAND.

Source: Reliable.

(13718.)

10 August 1920.

1. From a reliable source it is reported that when the German raider *Emden* sent a landing party ashore on Cocos Island to destroy the British cable that their efforts resulted in a total failure, and that the cable was actually in operation the following day.

2. The method by which the German efforts were nullified may be of interest and may illustrate an occurrence that might take place in a future war.

3. At least two sets of instruments were kept on hand by the cable station. The spare sets were buried and the cable itself was disconnected and buried under water tangent to the shore. A dummy cable was connected up in its place and lead into the sea.

4. According to the informant this ruse was successful. The dummy cable was torn up and the instruments smashed. In spite of this, the station is said to have been under operation the following day.

COMMERCIAL PACIFIC CABLE, MANILA TO GUAM.

Source: Reliable.

(13483.)

14 October 1920.

An official of this company reports that a change is being contemplated in the route of this cable through San Bernardino Strait. It appears that the conditions in this strait are very unfavorable and that due to past difficulties with the cable at this point, the strait may be avoided altogether by leading the cable from Manila to Sorsogon. From there it is planned to lead it overland across Sorsogon Peninsula. From the east coast of this peninsula it will then run to Guam.

It should be noted that during any hostilities this cable is exposed for cutting at this point and particularly so from any vessel based in the Pelew Islands.

SUBMARINES.

REGULATIONS GOVERNING SUBMARINE SCHOOL, KURE (IMPERIAL ORDINANCE NO. 363, PROMULGATED SEPT. 3, 1920).

Source: Reliable.

(11965.)

22 September 1920.

There shall be a submarine school where naval officers and men shall be taught science and arts and trained in practical duties relating to submarines.

The principles of education in the submarine school shall be decided by the chief of the navy education department, with the approbation of the minister of the navy.

Officials of the submarine school are: President, aid, chief instructor, instructors, division officers, chief surgeon, chief paymaster, officers and men, and clerks attached.

Courses in the submarine school are:

1. Higher course.
2. Common course.
3. Special course.
4. Elective courses.

Students of the higher course shall be appointed by the minister of the navy from those lieutenant commanders and lieutenants who have finished the common course or have careers corresponding thereto, to educate them in matters necessary to fit them to the important posts in submarines.

Students of the common course shall be appointed by the minister of the navy from the lieutenants and sublieutenants who have passed the common course of the gunnery, torpedo, or engineering schools, to educate them in matters necessary to fit them as officers of submarines.

Students of elective courses shall be appointed, when necessary, by the minister of the navy, to educate them in certain designated subjects relating to submarines.

Petty officers and men shall also be trained in the submarine school.

The period of education of the submarine school shall be decided by the minister of the navy.

The minister of the navy may order lectures to be given in the submarine school, to give navy officers and men knowledge necessary for them.

These regulations take effect from September 15, 1920.

NEW DUTCH SUBMARINES.

Source: Reliable.

(7460.)

12 October 1920.

The *K–III*, which was recently commissioned and which started for the East Indies about September 3, has arrived at Alexandria, Egypt, and reported that everything is working well, except that the boat is very hot and poorly ventilated.

K–IV is progressing slowly and her trials will not take place before the middle of December.

K–VIII is about 55 per cent completed.

K–IX, 45 per cent completed.

K–X, 40 per cent completed.

The *K–V* (Denny-Hay type) will leave for the Indies October 18 if no further troubles develop.

All these boats have had serious main motor armature trouble and all armatures have had to be sent back to the factory for repairs. This has been the principal cause of delay in completion of all these boats.

LAUNCHING OF NEW SUBMARINES "38" AND "39," JAPAN.

Source: Reliable.

(6452.)

14 October 1920.

Submarines *Nos. 38* and *39* were launched September 29 at Yokosuka.

These submarines are, as previously reported, of about 800 tons surface and 1,000 tons submerged displacement.

Dates for completion of vessels.

BATTLESHIPS.

Name.	Place.	Date.	Name.	Place.	Date.
Delaware	Boston	Jan. 4.	Connecticut	Philadelphia	Indefinite.
Florida	do	Nov. 20.	Michigan	do	Ready.
Utah	do	Jan. 4.	Minnesota	do	Dec. 13.
Arizona	New York	Do.	South Carolina	do	Ready.
North Dakota	do	Nov. 22.	Nevada	Norfolk	Jan. 4.
Pennsylvania	do	Jan. 4	Oklahoma	do	Do.
Tennessee	do	Indefinite.			

CRUISERS AND GUNBOATS.

Chester (Res.)	Boston	Indefinite.	Tacoma	Mare Island	Nov. 23.
Galveston	do	Do.	Charleston	Puget Sound	Nov. 30.
Rochester	New York	Jan. 4.	Charlotte [1]	do	Indefinite.
Columbia	Philadelphia	Do.	Missoula [1]	do	Do.
Frederick	do	Nov. 30.	Seattle [1]	do	Approved Dec. 15.
Denver	Mare Island	Approved Dec. 1.			

DESTROYERS AND DESTROYER TENDERS.

Colhoun	Portsmouth	Indefinite.	A. P. Upshur (fitting out).	Norfolk	Indefinite.
Israel (Res.)	do	Do.			
McKee (Res.)	do	Do.	Fenham (Res.)	do	Do.
Ringgold (Res.)	do	Do.	Clemson (Res.)	do	Do.
Robinson (Res.)	do	Do.	Connor (Res.)	do	Do.
Stevens	do	Do.	Dahlgren	do	Jan. 4.
Taylor (Res.)	do.[2]	Do.	Dowres (Res.)	do	Indefinite.
Conyngham (Res.)	Boston	Do.	Duncan (Res.)	do	Do.
Falk (Res.)	do	Do.	Goldsborough	do	Jan. 4.
Kimberly (Res.)	do	Do.	Graham	do	Do.
Luce (Res.)	do	Do.	Mason	do	Do.
Maddox (Res.)	do	Do.	Parker (Res.)	do	Indefinite.
Mahan	do	Jan. 4.	Satterlee	do	Jan. 4.
Meredith (Res.)	do	Indefinite.	Semmes	do	Do.
Murray	do	Jan. 4.	W. C. Wood (fitting out).	do	Indefinite.
Abbott	New York	Indefinite.			
Blackhawk (tender)	do	Jan. 4.	Belknap	Charleston	Jan. 15.
Hatfield	do	Do.	Cole (Res.)	do	Dec. 1.
Herbert	do	Do.	Aulick	Mare Island	Indefinite.
Leary	do	Do.	Babbitt	do	Do.
Preble	do	Do.	Bagger	do	Do.
Reuben James	do	Nov. 24.	Chauncey	do	Do.
Sampson	do	Indefinite.	DeLong	do	Do.
Schenck	do	Jan. 4.	Jacob Jones	do	Do.
Sicard	do	Do.	Melville	do	Dec. 15.
Sturtevant	do	Nov. 20.	Thornton	do	Indefinite.
Barney	Philadelphia	Jan. 4.	Twiggs	do	Do.
Bernadon	do	Do.	Ward	do	Do.
Blakely	do	Do.	Dent (Res.)	Puget Sound	Completed.
Crowninshield	do	Do.	Dorsey (Res.)	do	Nov. 30.
Craven	do	Indefinite.	Edwards (Res.)	do	Dec. 15.
Dixie (tender)	do	Do.	Rathburne	do	Nov. 30.
Peary (fitting out)	do	Dec. 10.	Roper (Res.)	do	Completed.
Pope (fitting out)	do	Do.	Talbot (Res.)	do	Nov. 30.
Winslow	do	Indefinite.	Waters (Res.)	do	Completed.

SUBMARINES AND SUBMARINE TENDERS.

S-9	Portsmouth	Mar. 1.	S-1	Philadelphia	Indefinite.
S-8	do	Indefinite.	Fulton	do	Do.
S-2	do	Do.	T-1	Norfolk	Do.
O-4	Boston	Nov. 30.	Camden	do	Dec. 15.
Savannah	do	May 28.	R-1, 2, 3, 4, 5, 6, 7, 8, 9, 10.	do	Indefinite.
K-1, 2, 3, 4, 5, 6, 7, 8	Philadelphia	Dec. 18.			
N-4, 5, 6	do	Indefinite.	F-2, 3	Mare Island	Do.
Eagle No. 33	do	Do.	H-6	do	Completed.
Beaver	do	Nov. 27.			

[1] To be placed out of commission.

[2] General repairs.

Dates for completion of vessels—Continued.

FLEET TENDERS (TRAIN).

Name.	Place.	Date.	Name.	Place.	Date.
Chewink	Portsmouth	Jan. 4.	Proteus	Norfolk	Dec. 30.
Lark	do	Do.	Redwing	do	Nov. 20.
Quail	do	Do.	Rail	Charleston	Jan. 1.
Rappahannock (Res.)	do	Indefinite.	Teal	do	Indefinite.
Solace	do	Jan. 4.	Widgeon	do	Do.
Bridge	New York	Dec. 18.	Comfort (Ord.)	Mare Island	Do.
Culgoa	do	Feb. 12.	Sonoma	do	Dec. 1.
Iuka	do	Not set.	Orion	Puget Sound	Dec. 25.
Robin	do	Indefinite.	Ortolan	do	Indefinite.
Mallard	Philadelphia	Not set.	Neptune	do	Dec. 30.
Lebanon	Norfolk	Feb. 12.	Swallow	do	Indefinite.
Prometheus	do	Jan. 4.	Vulcan	do	Dec. 15.

MINE FORCE.

Auk	Portsmouth	Indefinite.	Osprey	Portsmouth	Indefinite.
Cormorant (Res.)	do	Do.	Swan	do	Do.
Curlew	do	Do.	Woodcock	do	Do.
Flamingo	do	Do.			

AIR FORCE.

Shawmut	Philadelphia	Dec. 15.	Harding	Philadelphia	Dec. 15.
Sandpiper	do	Do.	Langley	Norfolk	Indefinite.

MISCELLANEOUS.

Patuxent	Portsmouth	Indefinite.	Hannibal (Res.)	Philadelphia	Approved Jan. 15.
Aramis	New York	Do.			
Nokomis	do	Do.	Water Barge No. 31	Charleston	Dec. 31.
			Tadusac	do	Nov. 20.

N. T. S.

Henderson	Philadelphia	Indefinite.	Trinity	Norfolk	Nov. 30.
Caesar	Norfolk	Do.	Newport News	Mare Island	Indefinite.
Quincy	do	Do.	Houston	Puget Sound	Dec. 31.

EAGLE BOATS.

Eagle No. 23	Portsmouth	Indefinite.	Eagle No. 25	Philadelphia	Indefinite.
Eagle No. 29	do	Do.	Eagle No. 60	Norfolk	Do.
Eagle No. 42	do	Do.	Eagle No. 57	Puget Sound	Do.

UNITED STATES SHIPPING BOARD.

Otsego	Portsmouth	Indefinite.	Agamemnon	New York	Indefinite.
Black Arrow	Boston	Dec. 4.	Castletown	Philadelphia	Do.

Battleships out of commission.

Name.	Place.	Name.	Place.
Louisiana [1]	Philadelphia.	Missouri [1]	Philadelphia.
Alabama [1]	Do.	Rhode Island [1]	Mare Island.
Illinois [1]	Do.	Vermont [1]	Do.
Kearsarge [2]	Do.	Wisconsin [1]	Philadelphia.
Kentucky [1]	Do.	Nebraska [1]	Mare Island.
New Jersey [1]	Boston.	Georgia [1]	Do.
Virginia [1]	Do.	Oregon [1]	Puget Sound.
Maine [1]	Philadelphia.		

[1] No work being done.

[2] Conversion into crane ship.

BATTLESHIPS UNDER REDUCED COMMISSION.

Name.	Place.	Name.	Place.
Connecticut	Philadelphia.	South Carolina	Philadelphia.
Michigan	Do.		

CRUISERS, GUNBOATS, AND MISCELLANEOUS OUT OF COMMISSION.

Dubuque [1]	Portsmouth.	Nashville [2]	Charleston.
Huntington [2]	Do.	Raleigh [3]	Do.
Isabel	Philadelphia.	Topeka	Do.
Ozark [2]	Do.	Monadnock [3]	Olongapo.
Pueblo [2]	Do.	Castine [3]	New Orleans.
Tonopah [2]	Do.	Bay Ocean [3]	Mare Island.
Yankton [3]	Do.	Machias [3]	Do.
Langley [4]	Norfolk.	Marblehead [3]	Do.
Standish [3]	Do.	Supply [3]	Do.
Wasp [3]	Do.	Yorktown [3]	Do.
Winchester [3]	Do.		

TORPEDO BOATS OUT OF COMMISSION.

CTB No. 6 (Morris) [2]	Newport.	Hopkins [3]	Philadelphia.
CTB No. 16 (Thornton) [2 3]	Norfolk.		

[1] General repairs.
[2] No work being done.
[3] To be sold.
[4] Conversion into aeroplane carrier.

EAGLE BOATS IN ORDINARY.

AT PORTSMOUTH.

Eagle No. 1.	Eagle No. 24.	Eagle No. 46.[1]
Eagle No. 2.	Eagle No. 26.	Eagle No. 48.
Eagle No. 3.	Eagle No. 27.	Eagle No. 50.
Eagle No. 5.	Eagle No. 28.	Eagle No. 52.
Eagle No. 9.	Eagle No. 37.	Eagle No. 55.
Eagle No. 13.	Eagle No. 41.	Eagle No. 56.[1]
Eagle No. 18.	Eagle No. 44.	Eagle No. 59.
Eagle No. 19.	Eagle No. 45.	

SUBMARINES OUT OF COMMISSION.

Name.	Place.	Name.	Place.
U-117 [2]	Philadelphia.	UC-97 [2]	Chicago.
U-140 [2]	Do.	UB-88 [2]	San Pedro.
UB-148 [2]	Do.	U-111 [2]	Portsmouth.
G-1 [3]	Do.		

SUBMARINES AND SUBMARINE TENDERS IN RESERVE.

D-1, 2, 3 [4]	New London.	K-1, 2, 3, 4, 5, 6, 7, and 8 [5]	Philadelphia.
Eagle No. 33	Do.	E-1 and 2	Hampton Roads.
Fulton	Do.	Eagle No. 17	Do.
G-3 [4]	Do.	L-1, 2, 3, 4, 9, 10, 11	Do.
N-1, 2, 3, 4, 5, 6, 7 [4]	Do.	M-1	Do.
Eagle No. 25	Philadelphia.	F-2, 3 [6]	San Pedro.

SUBMARINES IN ORDINARY.

A-3, 5 [7]	Cavite, P. I.	B-3 [7]	Cavite, P. I.

[1] Repairs completed.
[2] Being dismantled.
[3] Target for depth-charge experiments.
[4] S/M school, experimental and development work.
[5] Under repairs.
[6] Elemental S/M school work.
[7] No work being done.

VESSELS TO BE PLACED OUT OF COMMISSION IN NEAR FUTURE.

Name.	Place.	Name.	Place.
Elcano [1]	Asiatic Station.	Samar [1]	Asiatic Station.
Pampanga [1]	Do.	Villalobos [1]	Do.
Quiros [1]	Do.		

REDUCED COMMISSION OR ORDINARY.

Rappahannock [2]	Portsmouth.	Hannibal [2]	Philadelphia.
Chester [3]	Boston.	Comfort	Mare Island.
Caesar [2]	Norfolk.		

[1] To be sold. [2] General repairs. [3] No work being done.

DESTROYERS OUT OF COMMISSION.

AT PHILADELPHIA.

Ammen.	Jenkins.	Perkins.
Beale.	Jouett.	Roe.
Burrows.	Mayrant.	Sterrett.
Drayton.	McCall.	Terry.
Fanning.	Monaghan.	Trippe.
Henley.	Patterson.	Walke.
Jarvis.	Paulding.	Warrington.
Cushing.		

SUMMARY BY NAVY YARDS OF SHIPS UNDER REPAIR.

Name.	Date.	Name.	Date.
PORTSMOUTH, N. H.		NEW YORK.	
Colhoun	Indefinite.	Arizona	Jan. 4.
Israel (Res.)	Do.	North Dakota	Nov. 22.
McKee (Res.)	Do.	Pennsylvania	Jan. 4.
Ringgold (Res.)	Do.	Tennessee	Indefinite.
Robinson (Res.)	Do.	Rochester	Jan. 4.
Stevens	Do.	Abbott	Indefinite.
Taylor (Res.)	Do.	Blackhawk (tender)	Jan. 4.
S-2	Do.	Hatfield	Do.
S-9	Mar. 1.	Herbert	Do.
S-8	Indefinite.	Leary	Do.
Chewinck	Jan. 4.	Preble	Do.
Lark	Do.	Reuben James	Nov. 24.
Quail	Do.	Sampson	Indefinite.
Rappahannock (Res.)	Indefinite.	Schenck	Jan. 4.
Solace	Jan. 4.	Sicard	Do.
Auk (Res.)	Indefinite.	Sturtevant	Nov. 20.
Cormorant (Res.)	Do.	Bridge	Dec. 18.
Curlew (Res.)	Do.	Culgoa	Feb. 12.
Flamingo (Res.)	Do.	Iuka	Not set.
Osprey (Res.)	Do.	Robin	Indefinite.
Swan (Res.)	Do.	Aramis	Do.
Woodcock (Res.)	Do.	Nokomis	Do.
Patuxent	Do.	Agamemnon	Do.
Eagle No. 23	Do.	PHILADELPHIA.	
Eagle No. 29	Do.	Connecticut	Indefinite.
Eagle No. 42	Do.	Michigan	Ready.
Otsego	Do.	Minnesota	Dec. 13.
BOSTON.		South Carolina	Ready.
Delaware	Jan. 4.	Columbia	Jan. 4.
Florida	Nov. 20.	Fredcrick	Nov. 30.
Utah	Jan. 4.	Barney	Jan. 4.
Chester (Res.)	Indefinite.	Bernadon	Do.
Galveston	Do.	Blakely	Do.
Conyngham (Res.)	Do.	Crowninshield	Do.
Kalk (Res.)	Do.	Craven	Indefinite.
Kimberly (Res.)	Do.	Dixie (tender)	Do.
Luce (Res.)	Do.	Peary (fitting out)	Dec. 10.
Maddox (Res.)	Do.	Pope (fitting out)	Do.
Mahan	Jan. 4.	Winslow	Indefinite.
Meredith (Res.)	Indefinite.	K-1, 2, 3, 4, 5, 6, 7, 8	Dec. 18.
Murray	Jan. 4.	N-4, 5, 6	Indefinite.
O-4	Nov. 30.	Eagle No. 33	Do.
Savannah	May 28.	S-1	Do.
Black Arrow	Dec. 4.	Beaver	Nov. 27.

SUMMARY BY NAVY YARDS OF SHIPS UNDER REPAIR—Continued.

Name.	Date.
PHILADELPHIA—continued.	
Fulton	Indefinite.
Mallard	Not set.
Harding	Dec. 15.
Sandpiper	Do.
Shawmut	Do.
Hannibal (Res.)	Approved Jan. 15.
Henderson	Indefinite.
Eagle No. 25	Do.
Castletown	Do.
NORFOLK.	
Nevada	Jan. 4.
Oklahoma	Do.
A. P. Upshur (fitting out)	Indefinite.
Benham (Res.)	Do.
Clemson (Res.)	Do.
Connor (Res.)	Do.
Dahlgren	Jan. 4.
Downes (Res.)	Indefinite.
Duncan (Res.)	Do.
Goldsborough	Jan. 4.
Graham	Do.
Mason	Do.
Parker (Res.)	Indefinite.
Satterlee	Jan. 4.
Semmes	Do.
W. C. Wood (fitting out)	Indefinite.
T-1	Do.
Camden	Dec. 15.
R-1, 2, 3, 4, 5, 6, 7, 8, 9, 10	Indefinite.
Lebanon	Feb. 12.
Prometheus	Jan. 4.
Proteus	Dec. 30.
Redwing	Nov. 20.
Langley	Indefinite.
Caesar	Do.
Quincy	Do.
Trinity	Nov. 30.
Eagle No. 60	Indefinite.
CHARLESTON.	
Belknap	Jan. 15.
Cole (Res.)	Dec. 1.
Rail	Jan. 1.
Teal	Indefinite.
Widgeon (Res.)	Do.
Tadusac	Nov. 20.
Water Barge No. 31	Dec. 31.
MARE ISLAND.	
Denver	Approved Dec. 1.
Tacoma	Nov. 23.
Aulick	Indefinite.
Babbitt	Do.
Badger	Do.
Chauncey	Do.
DeLong	Do.
Jacob Jones	Do.
Melville	Dec. 15.
Thornton	Indefinite.
Twiggs	Do.
Ward	Do.
F-2, 3	Do.
H-6	Completed.
Comfort (Ord.)	Indefinite.
Sonoma	Dec. 1.
Newport News	Indefinite.
PUGET SOUND.	
Charleston	Nov. 30.
Missoula	Indefinite.
Charlotte	Do.
Seattle	Approved Dec 15.
Dent (Res.)	Completed.
Dorsey (Res.)	Nov. 30.
Edwards (Res.)	Dec. 15.
Rathburne	Nov. 30.
Roper (Res.)	Completed.
Talbot (Res.)	Nov. 30.
Waters (Res.)	Completed.
Orion	Dec. 25.
Ortolan	Indefinite.
Neptune	Dec. 30.
Swallow	Indefinite.
Vulcan	Dec. 15.
Houston	Dec. 31.
Eagle No. 57	Indefinite.